

The Book of
ATARI SOFTWARE
1984

Edited by
Jeffrey Stanton,
Robert P. Wells, Ph.D.,
Sandra Rochowansky,
and
Michael Mellin, Ph.D.

THE BOOK COMPANY

11223 S. Hindry Avenue • Los Angeles, CA 90045

General Editor
Robert P. Wells, Ph.D

Managing Editors
Sandra Rochowansky
Michael F. Mellin, Ph.D

Contributing Editor
Jeffrey Stanton

Assistant Editors
Nancy Hayes
David Lansing

Graphics Production
Estela Montesinos
Argelia Navarrete

Administrative Assistant
Tina L. Hellier
Gaston A. Moraga

ISSN 0738-4904

ISBN 0-912003-04-9

Copyright 1984 ©The Book Company, a division of Arrays Incorporated. All rights reserved. Printed in the United States of America. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of the Book Company.

Atari 400, 600, 800, 1200XL, 1450XLD are trademarks of Atari, Inc., a division of Warner Communications. The use of trademarks and other designations is for reference purposes only.

This is a Book Company Publication. It is not connected with or sponsored by Atari, Inc. Atari is a registered trademark of Atari, Inc.

TABLE OF CONTENTS

INTRODUCTION	5
ENTERTAINMENT	11
BUSINESS	209
EDUCATION	263
UTILITIES	317
ATARI 5200	376
VCS GAMES	380
RECOMMENDED READING LIST	418
SOFTWARE PUBLISHING HOUSES	421
INDEX	425

INTRODUCTION

Any computer is only as good as the software that runs on it. As an Atari microcomputer owner, you are faced with a bewildering selection of software for a variety of applications. Programs offering similar functions have advantages and disadvantages as well as different prices, and it can be difficult to find the right program to meet your needs among the many competing for your software dollars. This is especially critical when a wrong choice could cost you hundreds of dollars, time, and a great deal of frustration.

There is, therefore, a great need for this second annual edition of *The Book of Atari Software*, an evaluative guide to hundreds of the most important software programs available for the Atari line of computers. It offers an inexpensive way to look for the exact program or programs to suit your needs. In the following pages you will find descriptions of some of the most popular, as well as specialized software programs presently available. We hope you will use it as a reference guide, as many software dealers do, to assist you in making informed and intelligent decisions when investing in software.

The Book of Atari Software first appeared in 1983. As an independent, consumer-oriented software review source, it was the first book of its kind and remains an original in the publishing field. It was based on the recognition that even well-stocked computer retail stores, the primary place people buy software, could not possibly hope to keep on hand even a fraction of the software available, nor did retail store personnel have the time to adequately review each piece of software that came on the market. It was impossible for the consumer to know what software was even available, or what the differences were between competitively priced packages. *The Book of Atari Software* and sister publications became an immediate success, remaining a microcomputer bestseller year after year. Given the abundance and growing variety of software available today, the need for critical evaluation continues to grow.

The Book of Atari Software 1984 is a critical review book, not a directory listing. If you want a mere listing of available software with perhaps a few lines from the manufacturer describing each product, you would need to go to another kind of reference guide. *The Book* covers a majority of the most significant programs on the market in a number of key areas; and each program covered here is analyzed in depth. Basic data and grades on important performance categories are summarized at the top, with descriptive information following on the program's strengths, weaknesses, and how it compares to similar packages. No public domain software is reviewed here, only commercial offerings.

The reviews and evaluations are produced by experts in their various fields. Accountants were given accounting packages, office managers and professional writers tested word processing programs, teachers were given educational programs, and so on. These packages were field tested—in the office, in schools, or whatever environment was appropriate. The Book Company does not review products in-house, or maintain a staff of professional writers. Instead, our reviewers are consumers, just like our readers (in fact, it is our readers who comprise our reviewing staff). They have no particular axe to grind, except the axe of consumer protection. We strive to maintain their freedom to report on the software exactly as they see fit. For this reason, we do not publish the name of the reviewer with each review, but give instead our collective thanks.

The programs reviewed in this book are not demonstration packages, but the real programs, just as you would purchase them off the shelf. If a reviewer has a problem with a particular package he calls up vendors for customer support, without identifying himself as a reviewer, to find out exactly the kind of help a vendor provides. (This sometimes accounts for the difference between Vendor Support grades for different programs from the same company.) We're not perfect. We sometimes make mistakes, but we are open to correction and take criticisms very seriously indeed. Reviews will always contain a subjective element, but everything has been done to ensure as fair and honest an evaluation as possible.

Trends and Forecasts

1983 turned out to be a turbulent year for Atari. They appeared to be riding high with the introduction of the sleek, new 64K computer, the 1200XL, at the Winter Consumer Electronics show in January of 1983. But the optimism did not last. The 1200XL, equipped with an Operating System that was incompatible with the Atari 400/800 computers, was a loser. Too many programs, including some of Atari's own, would not run on it. Combined with tumbling computer prices, an eroding share of the VCS game machine market, and a large number of unsaleable cartridge titles, Atari was forced to take an unprecedented second quarter loss of 330 million dollars. Certainly, the actual cash loss was not near that amount, but the loss did allow them to write off all their old inventory and probably their California factory as well.

To recoup, Atari merged their game division with the computer division. This proved a good first step, for it eliminated internal competition. But what was really needed was a replacement for the top end of their line and a low end machine with a "real" keyboard. An entire new line of computers was announced at the Summer Consumer Electronics show in Chicago. The new 600XL with a full stroke keyboard replaced the 400. Two new computers, the 1400XL and the 1450XLD it was hoped would top out the line. The 1450XLD is a business machine with a faster, built-in disk drive, built-in modem, and speech synthesizer. All computers have an open processor bus for future expansion. Atari also announced a new disk drive with a higher storage density and an entire line of new accessories, including printers and a direct connect modem. A step in the right direction, but we are still awaiting delivery of these options as of this writing. While the factory in the Orient has geared up, losses rose to half a billion dollars by the third quarter of '83.

Currently Atari is running several months behind production. By the end of 1983 Atari will have shipped approximately 200,000 computers, a combination of 600XL's and 800XL's. The 1400 XL series probably won't reach the shelves until January 1984. Hopefully, Atari will survive scathed but undaunted. Of all the low-cost computers on the market, Atari offers the best graphics and the most reliable performance by far.

Third party software vendors taking advantage of more than one million Atari home computers began creating new software and translating the best of their Apple products in earnest. Although many offer new database, word processing, and educational products, their mainstay is in the game market. Skeptics ponder the viability of such a lopsided entertainment market, but continual sales show that that's what the public wants and buys. But while Atari computers *are* the best game computers manufactured, the machine is also expanding its applications into the business and educational market.

In 1984, the Atari software market will begin to shift more toward education and telecommunications. The arcade game market will not disappear, for the public seems to be hooked. However, expectations have expanded and matured, and new games will certainly need to be creative, imaginative, and have more depth of play than ever before. Double density disk drives will also help to expand business-related software. In addition, the new languages like BASIC XL and ACTION will encourage owners to create their own software. The micro computer market is a fast-paced and exciting world—may the best survive.

NEW ATARI COMPUTERS

	600 XL	800 XL	1400XL	1450 XLD
MEMORY	16K Expandable to 64K	64K	64K	64K
KEYBOARD	Full Stroke	Full Stroke	Full Stroke	Full Stroke
COMPATIBILITY TO EXISTING SOFTWARE	100%	100%	100%	100%
BASIC	Built In with 24K ROM	Built In with 24K ROM	Built In with 24K ROM	Built In with 24K ROM
EXTRA FUNCTION KEYS	No	No	Yes	Yes
MONITOR JACK	No	Yes	Yes	Yes
ACCESS TO REAR PROCESSOR BUS	Yes	Yes	Yes	Yes
JOYSTICK PORTS	2	2	2	2
CARTRIDGE SLOTS	1	1	1	1
MODEM	No	No	Yes	Yes
SPEECH SYNTHESIZER	No	No	Yes	Yes
DISK DRIVE	No	No	No	Yes
LIST PRICE	\$200	\$300	\$500	\$800—\$900

NOTE: BASIC in ROM can be disabled for RAM by holding down OPTION key while switching on computer or by POKes from within a program. It may be possible to expand memory through rear processor bus to 192K. Details are not available yet.

Apology In Advance

While we have attempted to include the majority of known and available Atari software, we realize that there are a number of programs which have not been included. In most cases, omissions are a result of our not being aware of a program's existence or our inability to obtain and review a program in time to meet our press deadlines. We apologize for these omissions, and will try to keep you as current as we can with supplemental issues of *The Book*. We must also mention that software vendors change addresses frequently, and that the suggested retail prices of various products likewise change often. The information published here was correct to the best of our knowledge at the time we went to press, but is subject to change without notice.

We have made every effort to present fair and objective evaluations of Atari software. But it is appropriate to point out here that neither our reviewers nor The Book Company will be held liable for any mistakes or omissions that have occurred. We welcome comments from our readers, of course, and in future editions we will correct or revise errors which are brought to our attention.

Remember: *The Book* is merely intended as a guide to owners and would-be owners of Atari computers. As a consumer, it is your responsibility to do whatever further investigation you deem necessary before making your software purchases.

Thanks To The Reviewers

Once again we must gratefully acknowledge the reviewers who have made possible the 1984 edition of *The Book of Atari Software*. They have labored many hours to share their knowledge and experience with other owners of Atari computers. Our thanks to:

Bill Bacon
Derrick Bang
George Barti
Norma J. Berinstein
Louis A. Cortez
Jay B. Dorsey
Charles Dougherty
Michael Duncan
Walter Germer
Donald M. Ginsberg
R. DeLoy Graham
Allen Harberg
Lenny Harrison
Jan Hasley
Jeffrey Imig

Tricia Jordon
Gary Kevorkian
Harry Koons
Michael La Rochelle
Jan Lauritzen
Mike Marrowitz
Mike Mikus
David W. Neuendorf
Bruce D. Noonan
Peter L. Norloff
Dan Pinal
Jordan Powell
Roger A. Pruitt
Francis C. Rabuck
Davey Saba

Robert Sachs
K. S. Sadlier
David Sanford
David H. Schubmehl
Kim Schuette
Hank Shiffman
Tom Simondi
Robert A. Smith
Jane Suenderman
David Tomczak
Keith Valenza
Ray Watt
Gordon Wong
Don Worth

Criteria

Each program included begins with a listing of basic facts and a summary rating, followed by the review commentary. We employ the familiar A through F grading system:

A	B	C	D	F
(Superior)	(Good)	(Average)	(Poor)	(Unacceptable)

Basic facts about a program include its name, the company which manufactures it, its suggested retail price, and several categories which are not entirely self-explanatory:

Hardware Requirements: The hardware and other peripheral units required in order to run a program. Usually the minimum Random Access Memory (RAM) is listed in an abbreviated form; for example: "32K." 16K is standard, and programs requiring more RAM will not operate on the Atari 400 or 600XL unless memory has been expanded. Other programs may require a printer or some other enhancement to run properly. These, too, will be abbreviated: e.g., "48K, modem," "64K, two disk drives," etc.

Language: Programs are written in a variety of programming languages apart from Atari BASIC. Some of these require extra memory cards, operating systems, or other enhancements. Machine language, for example, runs faster than BASIC and is therefore desirable in games or graphics programs. You should be aware of the programming language before you buy a program.

Availability: This is on a one to ten scale, indicating whether a program is available from few dealers or many (10 is nearly all dealers).

Disk or Tape: Some programs come on cassette, to accommodate those Atari owners who do not have disk drives. A few programs are available in both forms. An asterisk ("*") indicates that the disk or tape is copy protected.

GENERAL

These are grading criteria that apply to almost all programs, regardless of category:

Overall Rating: This takes all facets and evaluation criteria of the program and, to some extent, comparable programs, into consideration.

Value For Money: Is the purchaser getting what he is paying for? Is it good value compared with similar programs? Are there "extras" available at reasonable prices?

Vendor Support: Does the software company back its product? Are they available to answer questions? Are they courteous and helpful? Will they replace a defective program disk, get you up and running quickly, repair damaged data disks? Are the prices charged for support excessive?

Documentation: Does the documentation answer all questions clearly, and is it extensive? Does it offer a tutorial? Is it well indexed? Is the printing easy to read, and the layout attractive and easy to follow? Does it make use of illustrations? Does it explain processes in technical jargon or plain English?

Error Handling: Does the program "crash" during execution? Are there proper error-trapping routines? Are the error messages you get on-screen mysterious or easily understood?

Reliability: Does the program consistently do what it's supposed to do? Does it do less than it claims to offer?

Visual Appeal: Does the program look attractive and well-designed on the screen? Is color used effectively? Does it produce clear graphs, charts, reports, and other illustrations? Does it scroll smoothly from screen to screen? Is it easy to design your own screens? Are its menu options easily understood?

BUSINESS

As the title suggests, those programs of a "practical" nature apart from educational and utility packages, even if designed for home use and not the office. One specific criterion not described above is:

Ease of Use: Are the screen designs and documentation clear and well laid out, enabling the new user to run the program with a minimum of difficulty? Does it involve annoying features, such as a lot of disk swapping or slow response time, in its operation?

EDUCATION

Any program which purports to teach or offer instruction. Specific criterion includes:

Educational Value: How effectively does the program teach its subject? Is the subject matter of limited or broad appeal?

UTILITIES

In general, those programs whose purpose is to enable you to use your computer more effectively. One criterion especially important to this category is:

Usefulness: Does the program offer a good, necessary, or important tool to the user?

ARCADE GAMES

This category refers to those games considered to be of the "shoot-'em-up" or "action" type. Specific criteria for this category include:

Challenge: Does the game challenge the participant, or is it a game one will tire of quickly?

Controllability: How responsive is the game to either keyboard, paddle, or joystick control?

Creativity: Has the author been creative and imaginative, or not?

Game Concept: Is the idea behind the game sound? Does it require strategy and offer a goal?

Game Depth: Does the game have much of a scenario? Does it offer a number of challenging levels?

Skill Involved: Does the game require strategy and skill, or is it based mostly on luck?

Holds Interest?: Is this game one you would like to play over and over, or is it one that you will soon lose interest in?

Graphics: Was excellent use made of the computer's graphics capabilities, or not? Are the visual effects pleasing or dull?

ADVENTURE GAMES

These games are those considered to be of the "puzzle," text, or (maze) adventure variety. Special criteria for this category includes:

Puzzle Quality: For adventures, how complex are the puzzles or riddles in the game? Does the mapping follow a logical sequence?

Originality: Is the game novel and inventive, or does it smack of conformity in concept and execution?

Vocabulary: For adventure games, how good is the parser, or how well does it understand words and commands that you input?

Text Quality: Are the descriptions imaginative, or bland?

Save/Restore: Does the game have a save-game feature, allowing you to continue later, and how accessible is it?

Difficulty: What is the level of difficulty encountered in this game? Is it challenging, or suited to novice adventure game players?

Graphics and Holds Interest: as above.

MISCELLANEOUS

You will notice that some programs are discussed but not rated. This will occur for one of several reasons:

(A) We received the program too close to the press deadline to thoroughly review it. We felt, however, that the program was of sufficient merit and/or importance to warrant some kind of consideration. Given the time constraints, we tried at least to describe it. A complete review should follow, either in a supplemental issue of *The Book* or a later edition.

(B) Some programs fall into such specialized categories that a reviewer with expertise in that particular area was not immediately available. However, the program appeared to be of sufficient worth to merit some comment.

(C) The Book Company is a division of a larger organization, Arrays Incorporated, which is engaged in software publishing. We have always provided impartial evaluations of software products, and therefore any programs that could involve a conflict of interest are not rated.

A Call For Reviewers

Help! Because software for the Atari computer continues to proliferate at an amazing pace, and the knowledge necessary to pick software wisely from a host of similar programs continues to expand, the need for our review service has never been greater.

We wish to take the opportunity at this time to issue a call for more reviewers. The variety of microcomputer applications is increasing (ranging from farm management to weather science), and we would like to enlist the assistance of Atari-owning experts in different fields. We want to make *The Book* as complete as possible, because frequently the only real notice the public will have of specialty programs will be in *The Book*. But because we provide consumer reports on programs, rather than simple directory listings, we need specialists to handle certain programs.

There are a number of benefits associated with being a reviewer, not the least of which is the possibility of amassing software that ties in to your particular area of interest. If indeed you wish to become a reviewer, please send us a description of your experience, the type of hardware that you own, and indicate your area of interest and expertise. We would also like a sample review (whether we've evaluated the program already or not), to give us an idea of your writing style. Please send the information to:

THE BOOK COMPANY
11223 S. Hindry Avenue
Los Angeles, CA 90045
ATTN: Review Dept.

And please be patient. It will take us a while to deal with all of the correspondence.

Attention: Software Publishers And Authors

The Book of Atari Software presents you, the producer of software, with a unique opportunity to greatly increase the visibility of your programs. There is no other single source of objective software evaluations for Atari owners like *The Book*. Our sales, surveys, and projection figures indicate that a substantial percentage of Atari owners either own or have consulted *The Book* before making their software purchases. Likewise, a large number of Atari dealers use *The Book* when recommending software for their customers, and as a reference to assist themselves in ordering products for their stores.

The task of locating, acquiring, and then reviewing the increasing number of software programs for the Atari computer is a huge one, and getting more complex each week. We need your help, to keep us informed about new products and enhanced versions of existing programs, and to supply us with copies for evaluation. At the same time, we will help you by providing you with a showplace for your product that is effective, far-reaching, and yet considerably less expensive than any form of advertisement you may be contemplating. Indeed, *The Book* is often the only substantial notice the public may receive of interesting specialized programs. In terms of valuable publicity and increased sales, many companies have found it to their advantage to be included in *The Book*.

What is the cost to you? Relatively little. All we require is two copies of your software for review purposes. Accompanying the software, we also ask that you include a suggested retail price list, information regarding necessary hardware requirements, and the name of a person to contact in case our reviewers have any questions.

Please send your review copies and relevant information to:

THE BOOK COMPANY
11223 S. Hindry Avenue
Los Angeles, CA 90045
ATTN: Review Department

GAMES & ENTERTAINMENT

Introduction	12
Fantasy & Role Playing Games	16
Adventure Games	26
Board Games	40
Sports Games	46
Gambling & Card Games	55
Arcade Style Adventures	60
Arcade Rescue Games	74
Scrolling Shoot 'Em-Up Games	81
Shoot 'Em-Up Arcade Games	94
Racing Games	122
Pinball Games	126
Maze Style Games	130
Flight Simulators	142
Climbing & Jumping Games	146
Arcade Style Games	157
Tactical Space & War Games	184
Puzzle & Strategy Games	190
Music	200
Miscellaneous Entertainment	204

GAMES & ENTERTAINMENT

One of the more significant advantages to owning an Atari Computer lies in the fact that the Atari has a dual personality. On one hand, the Atari is an extremely powerful personal computer capable of performing a variety of "practical" tasks. On the other hand, the Atari, due to its superb color graphics and sound capabilities, is also a "fun" machine. This section, "Games and Entertainment," deals with that facet of the Atari character.

Games in general, especially during the last year, have evolved from simplistic shoot-'em-up scenarios into lengthy adventure simulations or games with high speed, arcade-quality animation. The days have passed when player missile graphics was a mystery to all but a few, and games written in BASIC represented the only viable alternative to the average game programmer. Today's programmers are more sophisticated. They are totally aware of the Atari's capabilities. Their friends and competitors have provided challenges to them in setting new standards for game programming. Economic considerations have played a strong part in this process. The public, which has been spoiled by some of the best of the Atari game-oriented software and arcade game-playing experiences, is always looking for something better, new, and challenging.

Programmers who design games can be likened to writers creating works of fiction. There are hundreds of books of fiction written each year, with perhaps only nine plot types. Regardless of how well they sell initially (whether they sell because they are different, the author is hot, or they are widely promoted and/or package their work in a flashy cover), few editions will sell for a period exceeding a year. Most will quickly fall by the wayside. However, a few will become classics, selling to newcomers year after year. In the computer world, only *Adventure*, *Star Raiders*, *Pac-Man*, and *Asteroids* have achieved this rank so far. Other new games show promise of becoming "classics" as well, but technology is advancing too rapidly. Even today's best games may soon be considered too primitive.

Meanwhile, games are increasing in magnitude as programmers attempt to give the public something better for their money. With game prices steadily creeping upward, the time it takes before players tire of a game is becoming an important consideration, especially when games can no longer be traded because of protection methods.

Programmers are striving for spectacular effects in their games. Their games have a strong Atari graphics look: multiple graphics modes, four directional fine scrolling, colorful modified character-set backgrounds, and, of course, player missile graphics. Sound effects are becoming more realistic, and use is being made of two or more voice harmony in background music. This contrasts sharply with a large number of quality Apple games that are being transferred to the Atari by "rastering" them over in graphics mode eight with little or no sound and color changes.

There is a potpourri of entertainment programs available today. The sheer multitude of titles might suggest that a lot of people use their computer primarily for fun; and this is quite true for many Atari owners.

Adventure, Fantasy, Space and Other Role Playing Games

Did you grow up in the company of the Brothers Grimm, Snow White, the Red Fairy Book, Flash Gordon serials, the Three Musketeers, the Knights of the Round Table, or any of the three versions of the Thief of Bagdad? Have you read the Lord of the Rings, the Worm Ouroboros, The Incomplete Enchanter, or Conan the Conqueror? Do you enjoy Asimov? Remember Tom Swift? Have you ever wished you could cross swords — just for fun — with Cyrano or D'Artagnan, or stand by their sides in the chill light of dawn awaiting the arrival of the Cardinal's Guard? Ever wondered how you'd have done against the Gorgon, the Hydra, the bane of Heorot Hall, or the Bull that walks like a man? Would you have sailed with Sinbad or Captain Blood, sought passage on the Ship of Ishtar, or drunk of the well at the world's end? Did Aphrodite make Paris an offer you couldn't refuse? Would you seek a red-hued maiden beneath the hurtling moons of Barsoom, or walk the glory road with "Dr. Balsamo," knowing it might be a one-way street? Have you seen "Star Wars" and "The Empire Strikes Back"? Ever imagined you were John Wayne?

If any or all of your answers are "yes," you're a player of role-playing games — or you ought to be. (If your answers are all "No," you have either stepped through the looking glass by mistake, or fate knows your destiny better than you do.)

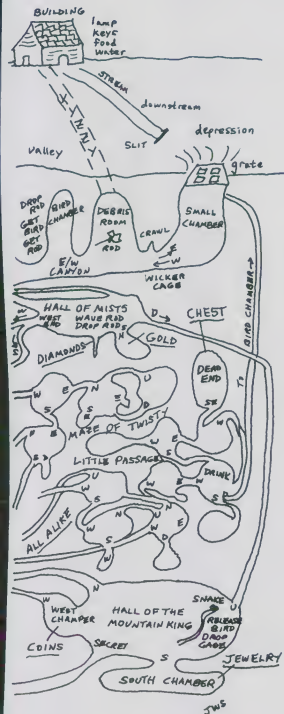
Role-playing games (RPGs) allow you a chance to step outside a world grown too prosaic for magic and monsters, doomed cities and damsels in distress... and enter instead a universe in which only quick wits, the strength of your sword arm, and a strangely carved talisman around your neck may be the only things separating you from a pharaoh's treasure — or the mandibles of a giant mantis.

The standard (non-computer) role-playing game is not, in its commercial incarnation, much more than a rule book — a set of guidelines a person used to create a world colored by myth and legend, populated by brawny heroes, skilled swordsman, skulking thieves, cunning wizards, hardy amazons, and comely wenches, and filled with cursed treasures, spell-forged blades, flying carpets, rings of power, loathsome beasts, dark towers, and cities that stood in the Thousand Nights if not in the Outline of History.

Role-playing games are not so much "played" as they are experienced. Instead of manipulating an army of chessmen about an abstract but visible board, or following a single piece around a well defined track, collecting \$200 every time you "PASS GO," in RPGs you venture into an essentially unknown world with a single piece — your alter ego for the game, a character at home in a world of demons and darkness, dragons and dwarves. You see with the eyes of your character a scene described by the "author" of the adventure — and no more.

The adventure-type games reviewed herein run the gamut from scenarios of ancient times to the far distant future, from fantasy to murder and war. In sum, selections from these programs will provide you with many hours of enjoyment and "exercise" for your imagination.*

*Our thanks to Automated Simulations for allowing us to excerpt from the booklet accompanying their excellent program, "Temple of Apschai" comments concerning Adventure Games in general.



A
"TYPICAL" MONSTER YOU
MIGHT ENCOUNTER DURING
AN ADVENTURE

Fantasy & Role Playing Games

ALI BABA AND THE FORTY THIEVES

Company: Quality Software

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$32.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING	B	DIFFICULTY	C	ORIGINALITY	B
PUZZLE QUALITY	C-	EASE OF USE	B+	DOCUMENTATION	A
TEXT QUALITY	B	VOCABULARY	N/A	Holds Interest?	B+
GRAPHICS QUALITY	A-	SAVE/RESTORE	B-	VALUE FOR MONEY	B+

Ali Baba and the Forty Thieves is a delightful role-playing fantasy game. The Sultan's daughter has been kidnapped by the ruthless band of thieves, and has been taken to the thieves' stronghold deep inside a treacherous mountain. You play the famous Ali Baba, and have been summoned to rescue the lovely princess.

You enter a world filled with exciting characters, each with his own strength and allotment of weapons, and armor. Some of these are loyal to the sultan and will assist you in your quest, but there are many opponents who must be overcome. Ferocious tigers, ruthless bandits, magical swords, and a deadly dragon are among the more than one hundred creatures you will face. These have a reincarnation ratio which you can adjust.

The game may be played by either keyboard or joystick. Joystick mode is by far the easier method. And when other characters are created to help Ali Baba in his quest, they can be assigned to different joysticks so that up to four players can play at once. The game is also novel in that a player can leave the game for an hour and return later to that same character again. Players can move, create new characters, buy armor or weapons, search for hidden doors, and open treasure chests.

The graphics are refreshing. As you enter each room, the contents, including visible exits, are identified by a moving cursor. While this slows game play substantially, it does help you familiarize yourself with the symbols used throughout the game. Various runes contain messages, and when you touch one of these, the message is displayed in lettering that is reminiscent of ancient Arabic writing. The accompanying music is a delight to the ears — a few bars of Rimsky-Korsakov's *Scherzade* done in multi-part harmony.

There is a degree of puzzle content, but it's not really sufficient to classify *Ali Baba* as an adventure game per se. Hints, either obtuse or blunt, are found in Runes. These cause your disk to wake up when encountered; other than that, there is no disk interaction in the entire 60-plus room game. New Hi-Res displays are nearly instantaneous, but the unfortunate byproduct of this is a very slow response in the interminable sequence of combative encounters. These delays are only slightly offset by the humorous text accompanying the encounters. Even with the Monster Regeneration Factor (i.e., difficulty control) set to zero, there seems a near endless procession of assault-minded thieves and assorted monsters. Mitigating this, but again at the expense of longer delays before it is once more your turn, there is the ease of calling in a veritable army of allies, including yourself, or any favorites that may have just been killed off. This multi-player capability also simplifies the difficult task of mapping, made complex by the extensive use of one-way doors and teleporting locations. The game is divided into dungeons and outside areas. Gold can be discovered in chests throughout both sections.

You may encounter in your adventure two other captives, Abdulla and Morgiana. Free them, and they show their gratitude by aiding you in your quest. If you are very virtuous, a unicorn may come to your aid in fighting the monsters. Be very wary of moving statues and collapsing tunnels: things are not what they seem in many parts of the dungeon, so explore with caution.

A particularly novel and amusing feature is that the bad guys, all being played by the Atari computer, are not too particular whom they clobber, and will gladly pile into other bad guys. It's fun (in a devilish sort of way) to start a fight, and then sit back and watch your enemies go at it. This feature, together with the multi-player capability, make *Ali Baba* great fun. This unique Hi-Res adventure should be a part of every player's collection.

TEMPLE OF APSHAI

Company: Automated Simulations [EPYX]

Language: BASIC

Hardware Requirements: 32K; disk drive or cassette player.

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 6

Disk or Tape: Both

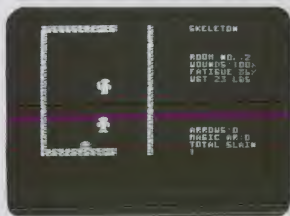
OVERALL RATING	B	CONTROLLABILITY	B-	ERROR HANDLING	A-
GAME CONCEPT	B+	SKILL INVOLVED	C	DOCUMENTATION	B+
CREATIVITY	B	CHALLENGE	C+	HOLDS INTEREST?	B+
GAME DEPTH	B+	GRAPHICS	B-	VALUE FOR MONEY	B

A fantasy role-playing game is a type of game that gives the player certain attributes in order to accomplish a particular goal or task. *Temple of Apshai* is a good example of this type of game. The player must utilize such attributes as dexterity, intelligence, strength, tools, fatigue, and so on, to fight his way through a maze populated with monsters and other untoward dangers.

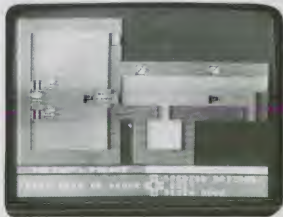
This is the longest and most versatile of the *Dungeonquest* series. The *dungeonmaster* program allows you to create your own characters; alternatively, you can let the computer choose character traits and abilities at random. Your player moves through a series of rooms displayed on the Hi-Res screen, and gains experience or treasures while fighting a never-ending series of terrible monsters. The combat portion is nicely conceived. Your character can attack, thrust, parry, or fire arrows. Of course, he has to be facing the opponent. All movement and fighting commands are single stroke keyboard commands. This means that you have to become fast and proficient in the limited time allotted to your making a move. The monsters don't wait for you to turn around or fight. One of the drawbacks in the game is that a monster's status isn't displayed. You never know how much fight is left in it, and might use one of your precious arrows to finish it off when it only needs one more sword thrust. Also, since your commands are held until executed, sometimes you waste a shot after the monster's demise. Your status is displayed on the left of the screen. You can tell immediately how wounded or fatigued your character becomes. If the status of your wounds becomes zero, you die. There is of course the possibility of resurrection; but that depends on who finds you. The dwarf and wizard demand a very stiff price in treasure or belongings.

The object of *Temple of Apshai* is to explore a four-level dungeon and obtain its twenty treasures. Some rooms contain secret doors and traps. Whenever you leave the dungeon, you can pawn your treasures at the inn for weapons, armor, and healing salves. Since the program doesn't keep track of each treasure's worth (you look it up), it is quite possible to cheat.

The author has shown as much thought in preparing the documentation as in writing the program. The documentation includes a "Book of Lore," which not only relates how to play the game, but provides the player with the background and mechanics of fantasy role-playing games in general. In sum, this is an excellent game, one that's very involving. With its numerous difficulty levels and play options, the game can last for hours. Fortunately, games can be saved if you become pressed for time.



TEMPLE OF APSHAI



ALI BABA

HELLFIRE WARRIOR

Company: EPYX/Automated Simulations
Language: Basic
Hardware Requirements: 32K, disk drive.

Department: Entertainment
Sugg. Retail: \$39.95
Availability: 7
Disk or Tape: Disk*

OVERALL RATING	B	EASE OF USE	B-	ERROR HANDLING	A-
GAME CONCEPT	B+	SKILL INVOLVED	C	DOCUMENTATION	B+
CREATIVITY	B	CHALLENGE	B+	HOLOS INTEREST?	B
GAME DEPTH	B	GRAPHICS	B-	VALUE FOR MONEY	B

Hellfire Warrior is a full-length Hi-Res adventure game that almost literally starts where *Temple of Apshai*, also by Automated Simulations, left off. It has no time limit, as do the shorter *Morloc's Tower*, *Datestones of Ryn* and *Rescue at Rigel* programs, but it have the same system commands and overall format as does the longer *Temple of Apshai*.

The game requires exploration of Levels Five through Eight of the *Temple of Apshai*. Your character explores the 60 rooms of each level in search of treasures and a sleeping Brunhilde. Naturally, a multitude of monsters are encountered and must be dealt with. The level number is proportional to the strength and power of its inhabitants, so if you're brand new to the Automated Simulations series, you might consider the *Temple* or, for the general flavor of the game system, the faster playing *Morloc's Tower*. On the other hand, if you liked the predecessors you'll love *Hellfire Warrior*.

GATEWAY TO APSHAI

Company: EPYX/Automated Simulations
Language: Machine
Hardware Requirements: 16K

Department: Entertainment
Sugg. Retail: \$40.00
Availability: 6
Disk or Tape: Cartridge

OVERALL RATING	B	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B+	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	B	CHALLENGE	B	HOLOS INTEREST?	B
GAME DEPTH	B-	GRAPHICS	B	VALUE FOR MONEY	B-

Gateway to Apshai fits the arcade style of fantasy role-playing more than its sister product, *Temple of Apshai*. The game takes place in real time with a joystick-controlled hero, thus progressing faster. You gather treasure in a multi-level dungeon filled with traps and monsters. The game presents a choice of sixteen different, huge dungeons containing seventy rooms on each of eight levels. You have six and a half minutes to explore each level. If you finish in time, you teleport to the next level which is deeper and harder. The game ends when you have completed all eight levels—or have exhausted your eight lives. Luckily, your hero is endowed with strength, agility, luck, and health. The computer awards you bonus points if you fight well and complete a level under the time limit. Watch your health as death occurs if that value falls to zero, although sometimes you find healing salve to restore your health.

You play the game using a joystick and three function keys. The Option key lets you use items in your bag, for example, a key to unlock doors. The Select key lets you search a room for a secret door or trap, drop an item, move to the next level, or check your status. The Start key puts you in the fight mode. You begin with a dagger, but soon obtain a bow, arrows, and a short sword. You switch between weapons by repeating the fight mode command.

As you begin your search, the unexplored areas are hidden. When you move into a room, its contents and walls become visible. Sometimes bats, snakes, ghouls, and slime mold protect the treasure. Most you can kill with a sword thrust, but it is safer to kill them from afar with an arrow. Draw your weapon quickly, as a monster may lurk nearby. Treasures and other items, like healing potions and spells, are easily acquired and with little regard for traps—they seem to have little effect.

Although *Gateway to Apshai* is an introduction to the more difficult fantasy role-playing games like *Temple of Apshai*, I found it a better game in many ways. First, it moves faster and holds your attention longer. Second, it eliminates many of the keyboard commands that prove so frustrating to children. Yet the game retains much of the flavor that made the original series popular. Finally, the cartridge form makes it available to owners of Atari 400 and 600XL computers.

CURSE OF RA

Company: EPYX/Automated Simulations

Language: BASIC

Hardware Requirements: 32K, disk drive.

Department: Entertainment

Sugg. Retail: \$19.95

Availability: 7

Disk or Tape: Both

OVERALL RATING **B**
GAME CONCEPT **B+**
CREATIVITY **B**
GAME DEPTH **B+**

CONTROLLABILITY **B-**
SKILL INVOLVED **C**
CHALLENGE **C+**
GRAPHICS **B-**

ERROR HANDLING **A-**
DOCUMENTATION **B+**
HOLDS INTEREST? **B+**
VALUE FOR MONEY **B**

Curse of Ra is the second expansion module for the *Temple of Apshai*, which you must have in order to make use of this program. This module adds four new levels to explore, more treasures to find, and more monsters to fight. Getting started requires booting *Temple of Apshai*, awakening or creating a new character, and inserting *Curse of Ra* when you're ready to leave the inn.

The setting is ancient Egypt; the task is to gain entrance to each of two pyramids, the Great Sphinx and the powerful Statue of Ra, and get the four treasures powerful enough to overcome the Curse of Ra. Naturally, inhabitants of these pyramids take exception to trespassers, and there are numerous traps and associated dangers. Due to the power of some of the monsters, it is advised to visit each level in numerical order. *Ra* contains over 100 rooms, and mapping is still a must. To complicate life, there are many secret rooms that are disclosed only by careful examination.

Game technique is the same as *Apshai*. Hi-Res figures are seen inside or outside of a maze of walls, as if viewed from above. Each level has room and treasure descriptions, but only in the Player's Manual — a distraction to the flow of the game, especially if one is trying to fight off a monster at the same time. As before, running away from some monsters will materially prolong your character's life.

Survival in *Ra* is not too difficult, and players of the *Dunjonquest* series will thoroughly enjoy this new addition of monster-whomping, mapping, and exploration.

STARQUEST/STAR WARRIOR

Company: EPYX/Automated Simulations

Language: Atari BASIC

Hardware Requirements: 32K; disk drive or cassette player.

Department: Entertainment

Sugg. Retail: \$30.00

Availability: 7

Disk or Tape: Both

OVERALL RATING **B**
GAME CONCEPT **B**
CREATIVITY **B-**
GAME DEPTH **B-**

CONTROLLABILITY **B**
SKILL INVOLVED **B**
CHALLENGE **B**
GRAPHICS **C+**

ERROR HANDLING **N/A**
DOCUMENTATION **B**
HOLDS INTEREST **B**
VALUE FOR MONEY **B-**

Compared to Automated Simulations' earlier programs, *Star Warrior* is more like a shoot-'em-up, Real Time game (especially at the higher difficulty levels), and seemingly faster paced. It is difficult to beat, while presenting even experienced players with a significant challenge during each new game.

As a futuristic and well-armed space warrior, you have your choice of two scenarios and three types of armored weaponry (plus a customizing capability). In one scenario, your mission is to create a diversion while your unseen compatriot attempts to clandestinely locate and assassinate the tyrannical Military Governor of the beleaguered planet Fornax. In the second scenario, you assume the assassin's role. In either case, you will have your hands full locating (or evading) nine different types of mobile armed units, two forms of fixed weapons, and three types of fixed installations, including "Civilian" (which is a no-no for your attacks). Your potent forms of weaponry are: semi-invisibility, and the ability to fly, jump, and move through four types of terrain, all the while managing a limited energy supply.

The background and the game-specific documentation are very good, as are the Hi-Res graphics. The commands are sufficiently varied and inclusive to fully control your "destiny," and make for a very challenging game, even at the lowest difficulty level. While bearing strong resemblances to *Rescue at Rigel* and *Dunjonquest*, *Star Warrior* moves at a faster pace, and provides a greater degree of personal involvement.

GWENDOLYN

Company: Artworx

Language: BASIC

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$27.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING	D	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	F	DOCUMENTATION	B
CREATIVITY	C-	CHALLENGE	F	HOLDS INTEREST?	F
GAME DEPTH	D	GRAPHICS	C	VALUE FOR MONEY	F

Gwendolyn is a single-player graphic adventure program by the author of *Crypt of the Undead* and *King Arthur's Heir*. In this game, you are Prince Maracus, whose bride-to-be, Princess Gwendolyn, has been abducted by an army of dwarves. You must search through the caverns beneath your kingdom and rescue the lady from her captors.

At each point during the game, you are presented with a picture of your location, along with the compass directions in which you may move. You push your joystick in the desired direction and press the fire button to move, at which point a picture of the next location appears. Pressing the fire button without moving the joystick calls up a menu of additional functions. These include picking up objects, using these objects, getting an inventory, saving the game, and displaying your score. This last function serves no particular purpose, because you get no hint of what this score means.

The instructions mention some of the objects to be found along the way, along with their peculiar functions. This is important, since using an object outside of the room where you should use it will cause it to explode. This is the only obstacle in the game, other than the effort of mapping the caverns. You cannot lose this game except by destroying a needed object. (In testing this game, I simply saved the game before trying objects. If I chose the wrong object, I could then restart at that point, thereby not wasting any time.)

None of the problems presented in *Gwendolyn* proved even mildly difficult. As with his previous games, the author has provided clues so obvious as to insult the intelligence of his audience. Assuming that you keep a reasonably accurate map as you go along, the entire game can be played in under two hours, unless boredom reaches you before you reach the princess.

DUNZHIN

Company: Screenplay

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING	D+	CONTROLLABILITY	D	ERROR HANDLING	N/A
GAME CONCEPT	C+	SKILL INVOLVED	D+	DOCUMENTATION	C
CREATIVITY	C-	CHALLENGE	C-	HOLDS INTEREST?	C-
GAME DEPTH	C	GRAPHICS	D+	VALUE FOR MONEY	D

Dunzhin is one of a series of programs that attempts to bring fantasy/role-playing games to the Atari. You are a level one warrior outfitted with a sword and suit of chain mail who seeks certain valuable objects in the lowest level of a dungeon inhabited with monsters and full of deadly traps. Your battle experience slowly increases until you can tackle the strongest foes who inhabit the deep, dark passageways.

This game is played by keyboard commands. The map is automatically drawn as you explore each level of the dungeon, and each of the 15 rooms is designated by a letter on separate floors. Three teleport you to a random room on another level, three are filled with poisonous gas, and three heal you. In addition, there are three armor repair rooms in the dungeon. Most of the monsters are in the hallways, but a few guard treasure in some of the rooms. The main object in the lowest level is guarded by three nasty monsters.

Keyboard movement becomes tedious in long games. For example, to move east two squares requires the command, M E2. Joystick control should have been implemented in this TRS-80 translation to make things easier. Likewise, battle commands require you to designate both the command and the area you wish to aim at. The battles become long, drawn out events, and sometimes you want to avoid this tedium by bribing a monster or fleeing just to speed up the game. Traps are time oriented and require a quick response to escape.

On the whole, *Dunzhin* is a fair, cohesive, but sometimes tiring game. The graphics, while adequate, lack excitement and animation, and an easier control system with better graphics would have been a big improvement. This text game draws its map while the warrior explores. Fortunately, it has a save game feature for those who plan to continue over a period of days.

CRUSH, CRUMBLE AND CHOMP

Company: EPYX/Automated Simulations

Language: BASIC

Hardware Requirements: 32K, disk drive.

Department: Entertainment

Sugg. Retail: \$30.00

Availability: 8

Disk: Disk*

OVERALL RATING	B+	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	A-	SKILL INVOLVED	B+	DOCUMENTATION	B+
CREATIVITY	A-	CHALLENGE	A-	HOLDS INTEREST?	B+
GAME DEPTH	B+	GRAPHICS	C	VALUE FOR MONEY	B

In *Crush, Crumble and Chomp* you can play one of six featured monsters (or one of your own home-grown creatures) to attack the city of your choice: San Francisco, Washington, D.C., New York City, or Tokyo Harbor. With your fiery breath you can burn entire cities or smash them underfoot. You can block roads with your webs and escape underground where tanks dare not tread. Your monster can tear apart bridges with its tentacles, emit an ultrasonic scream as you grab the populace and fly over a city of smoking ruin.

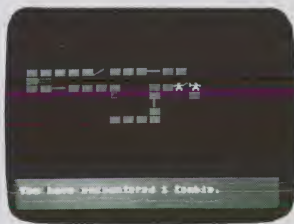
Of course, being a monster isn't easy. You're always hungry. A good rule is: if it moves, it's edible. And the city, played by your friendly computer, has an arsenal of police cars, tanks, artillery, helicopters, National Guard, and your indomitable mad scientist.

You control the monster with a variety of keyboard commands. All monsters have a basic command structure that controls general direction, head position, and movement. Some monsters can burrow, another can fly. All can crumble buildings or grab individuals fleeing in the crowds. Each has its specialty, like (A)tomize or (U)ltrasonic Scream, (B)reathe Fire, (W)eb (weave obstructing web), or (Z)ap flying units with ray gun. Control is rather sluggish. This is because you're taking turns with the computer and it's not ready for your next command. Be patient; the computer has to update the screen and attack before you can make the next move. Unfortunately, by the time it allows you to enter the next command your prey has moved away. Also, you can't change your mind once you type a command and must wait for your next turn to correct your error.

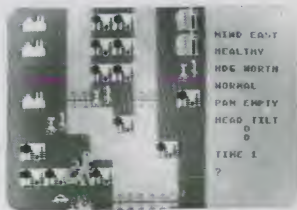
You can monitor the game on a map as you move around sections of the city. Your monster's health, his hunger status, head position, and general direction are all displayed on the right side of the screen. The head position is displayed in all its living facial monster horror. It keeps you aware of who or what you are.

Yes, this game is for real and it actually can be fun to play once you get used to the keyboard controls. It is certainly a way of releasing your aggressions and no different than those shoot-'em-up games where you play the good guy and kill the aliens.

The graphics are a little disappointing. The display map and animation are done with animated character set graphics, but the display update is slow and cumbersome. As a translated Apple game, it does not take advantage of the Atari's fine scrolling capabilities. Instead, this game laboriously draws a new map once the monster goes off the edge of the screen. In a game that essentially runs in Real Time, this is somewhat distracting. Despite the game's rather slow play, it offers a lot of creativity, is challenging, and is well documented in a lengthy but humorous vein.



DUNZHIN



CRUSH, CRUMBLE & CHOMP

EXCALIBUR

Company: APX

Language: Machine

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING	A	CONTROLLABILITY	A-	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	A	DOCUMENTATION	B+
CREATIVITY	A-	CHALLENGE	A-	HOLDS INTEREST?	B+
GAME DEPTH	A	GRAPHICS	B	VALUE FOR MONEY	A-

The brightly glowing sword rising slowly out of the water on the title page sets the scene for the adventure-war game *Excalibur*. It transports you back to the days of Arthurian legend and the small kingdom called Camelot. Here Arthur forged a new kingdom, with the aid of Merlin the magician and the prowess of the knights of the Round Table.

Chris Crawford and his staff of programmers at Atari's Games Research spent twenty months developing this mammoth game, perhaps the largest ever designed for the Atari computer. For you to play the interconnected segments of the game, you must constantly reload disk files. The object is to unite Britain. This task proves difficult because Camelot, a small kingdom, has few knights to aid in the conquest. In addition, rival kingdoms with power-hungry kings surround it. Arthur must bide his time, meanwhile raising and training an army both for defense and offense. To achieve his objective requires diplomacy rather than fighting, lest he weaken his meager forces further in profitless combat. Instead he makes alliances, demanding tribute for protection. To accomplish this, he must first prove to the lesser kings that he can defeat them in battle. Solving this problem requires subtlety and experience. Luckily, he has the aid of his knights and Merlin. Merlin is both powerful and loyal, but the knights less so. Watch where they stand in the throne room. Loyal warriors stand close to the throne. Some can be influenced by gifts or honors, and may flee to save themselves in battle rather than fighting for their king. Merlin, however, uses his magic to help Arthur. But the more he uses his power, the weaker it becomes, and this limits his ability. He has constructed a map room for the king that shows all of the British kingdoms and reveals enemies and news. All magic takes place in his own room. There he can cast a plague on an enemy's army, or pestilence on a rival's crops, weakening them in their opposition to Arthur. From here he can invisibly transport Arthur to another king's castle to spy on the treasury (to determine the enemy's wealth), the throne room (to tally the power of the king's knights), or the map room (to gauge the king's feelings towards Camelot or another kingdom).

Arthur's own treasury room marks the location of all financial decisions, such as raising taxes and spending money to raise an army. Here he keeps records of tribute paid to him or that he must pay. One column in the records lists the actual values, while a second lists projections (subject to change by joystick control).

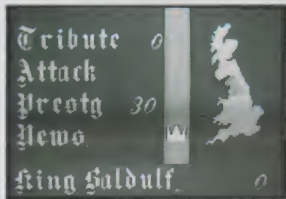
If Arthur decides to battle a neighbor, he goes to the map room and declares war on that kingdom, which then turns red on the map. Green signifies neutrality. Next, Arthur moves to the Round Table Room and chooses knights to help him fight. Each knight brings along the peasants that he has trained as soldiers. Arthur should leave at least one knight behind to defend the kingdom. When he exits the throne room, he enters the countryside outside the castle. The computer pauses here to load a large, scrolling map that shows the entire island of Britain, its rivers, seas, castles, and farmland. Arthur and his small band of knights march cross-country to the enemy king's land and begin to pillage his crops. If the enemy king decides to fight, a sword appears in challenge. The computer now pauses to load the battle portion of the game, which resembles Crawford's *Legionnaire* war game. Two rows of knights face each other on the field, each designated by a shield (one of which spells Crawford's name backwards). Moving the cursor to a knight reveals his name and the number of soldiers with him. You give commands by moving the cursor to a knight, pressing the button, and repositioning the cursor to where you want the knight. The battle can become quite dynamic, with new orders given constantly as the battle progresses. When the knights meet, they flash and you hear clanging sounds. Strength, courage, and tactics determine the outcome. The novice relying on weaker forces often loses the first battle and thus the game.

The game's graphics vary widely. The castle rooms are plain yet informative, but Merlin's room is superbly rendered. Images there sparkle and fade magically. The scrolling map of Britain employs wonderful detail and color, but the battle scenes show only the shields to represent knights.

Excalibur is destined to become a cult game. A highly complex game of strategy, it requires hours, sometimes tens of hours to play. Fortunately, it has a Save-game option. It appeals mainly to the seasoned wargamer or fantasy role-player. Although slow, it holds your interest over an extended time once you have mastered some of the basic elements of play. It requires patience and restraint, certainly, and the novice will need to exercise them to avoid losing the game quickly and becoming discouraged. The level of difficulty alone may discourage many beginners, but those who persevere will find an ample reward in the game's incredible depth.



EXCALIBUR



EXCALIBUR

RESCUE AT RIGEL

Company: EPYX/Automated Simulations

Language: BASIC

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Both

OVERALL RATING

C+

GAME CONCEPT

B

CREATIVITY

B-

GAME DEPTH

C+

CONTROLLABILITY

C+

SKILL INVOLVED

C

CHALLENGE

B-

GRAPHICS

D

ERROR HANDLING

A

DOCUMENTATION

B

HOLDS INTEREST

B

VALUE FOR MONEY

C+

This game, modeled after the successful Dungeonquest series, is the first in their Starquest series. It is a science fiction game where you, the hero, attempt to rescue 10 humans held captive in a pyramid shaped Tollah moonbase. Armed with a blaster and a powerpack supplying your laser, shield and bionic gear, you attempt to find the humans and teleport them back to your base ship. The moonbase floors are connected by graveshafts and each floor and room has enemy Tollahs, monsters and sentry robots who consider you the enemy. The user has 60 minutes to complete the mission.

All commands are entered by keyboard as single letter commands (i.e., B = Blast, S = Shields, etc.) A quick reference card is supplied. Since *Rescue at Rigel* was the first of the EPYX games on Atari, it has very poor graphics. Nonetheless, it is a challenging game even on the easiest level, and enjoyable to play.

DATESTONES OF RYN

Company: EPYX/Automated Simulations

Language: BASIC

Hardware Requirements: 32K, disk drive or cassette

Department: Entertainment

Sugg. Retail: \$19.95

Availability: 6

Disk or Tape: Both

OVERALL RATING

C+

GAME CONCEPT

B

CREATIVITY

C+

GAME DEPTH

C

CONTROLLABILITY

B-

SKILL INVOLVED

C

CHALLENGE

C

GRAPHICS

C+

ERROR HANDLING

A

DOCUMENTATION

B

HOLDS INTEREST

C+

VALUE FOR MONEY

C+

Datestones of Ryn is the second of the Dungeonquest series of fantasy games. This is the first of their "mini-adventures," since the character is defined and a time limit of twenty minutes is imposed.

One spends time exploring a building filled with monsters and thieves that try to stop you from recovering the missing ten datestones. As in the others of the series, the positions of all objects and monsters are randomized in a set-piece map, which appears in sections as one explores. Fighting sequences are animated with shape tables.

See the review on *Temple of Apsai* by the same vendor for an even more extensive example of this type of program.

ULTIMA II

Company: Sierra On-Line Systems

Language: Assembly

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$59.95

Availability: 9

Disk or Tape: Disk

OVERALL RATING	A	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	B	DOCUMENTATION	B
CREATIVITY	B	CHALLENGE	B	HOLDS INTEREST?	A
GAME DEPTH	A	GRAPHICS	A	VALUE FOR MONEY	A

Ultima II is the long awaited follow-up to the original *Ultima*, a fantasy role-playing game by Lord British. It seems that when Mondrain was finally killed in the earlier game, we didn't find and deal with his apprentice, Minax. Now that she has come of age, she is even more powerful than her predecessor.

More than a simple successor with new maps and challenges, *Ultima II*'s three disk sides take you to several towers and villages, five time periods, and ten planets, in addition to the towns, castles, and dungeons that players of the original game will remember. This time, towns and castles, as well as villages, are in the colorful, multi-screen scrolling form that so distinguished *Ultima*. Each of their layouts and contents are different, except that one of the castles appears in two time zones. There are time portals, horses, ships, airplanes, and rockets to ride around in. Fewer dungeons and towns provide a more balanced game.

The commands are generally the same, but have been streamlined by dropping those which were seldom used and adding two more useful ones: an interrupt, (Y)ell, to permit a pause for thoughtful planning, and a (V)iew command which provides an excellent single screen graphic of the location in which you are currently scrolling your merry way. Without it, *Ultima II* would be a mapmaker's ultimate challenge; as it is, mappers will have plenty of action in the dungeons which seem to go on forever. The command execution time is also pleasantly speeded up over the original. The game even comes complete with a neat cloth map representing most of the time portals on a "from-to" basis; it's pretty, but not much use in the game.

To achieve the goal and rid the universe of Minax, your fantasy character (your choice of four races, three types, two sexes, and six allocatable attributes) faces many hours of searching, interrogations, and monster whomping. The monsters serve as a source of gold, and there are many ways to spend your hard-earned loot; many are mandatory if you are ever to succeed in winning. You only need to obtain two objects to defeat Minax, but both take time, thought, and money—so it's back to whomping monsters.

There are a few bugs, but none fatal. As a hint, load up on Strength at the outset, as it's the one attribute that can't be increased. Also, don't exit the town if any attribute goes over 99, unless you're rolling in gold. My only gripe is that it has the same Save-game routine as in the original *Ultima*. While you can save it at any point, it can be recalled only on Drive A through lengthy rebooting. Yet such defects pale in the face of the graphical *tour de force*; whether you played the first version or not, this one is a must.



ULTIMA II



ULTIMA II

MORLOC'S TOWER

Company: Automated Simulations

Language: BASIC

Hardware Requirements: 32K cassette

Department: Entertainment

Sugg. Retail: \$19.95

Availability: 7

Disk or Tape: Both

OVERALL RATING	B +	CONTROLLABILITY	B -	ERROR HANDLING	A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	B
CREATIVITY	C +	CHALLENGE	B -	HOLOS INTEREST	B +
GAME DEPTH	C	GRAPHICS	B	VALUE FOR MONEY	B -

Although *Morloc's Tower* is not as elaborate as the *Temple of Apshai*, Automated Simulations has provided yet another entertaining and challenging adventure game. The object of the game is to find and kill the mad wizard, Morloc. One spends his time wandering through the six floor dungeons, battling monsters and finding treasures.

A plus to this game is that every time you play this adventure, the traps, monsters and other surprises are found in different locations. In addition, you can compete against your friends or your own past performance. The game is appropriate for beginners as well as advanced players since there is no "right" way to win.

Documentation is excellent. The authors provide a very attractive layout with clear and concise instructions including helpful hints. As a last resort, the player may wish to read some of the "answers" which disclose where Morloc may possibly be found.

SURVIVAL

Company: United Software of America

Language: BASIC

Hardware Requirements: 40K, disk drive.

Department: Entertainment

Sugg. Retail: \$24.95

Availability: 4

Disk or Tape: Disk

OVERALL RATING	C +	DIFFICULTY	C +	ORIGINALITY	B
PUZZLE QUALITY	C +	EASE OF USE	B -	DOCUMENTATION	B +
TEXT QUALITY	C +	VOCABULARY	C	HOLOS INTEREST?	C +
GRAPHICS QUALITY	N/A	SAVE/RESTORE	B	VALUE FOR MONEY	B -

Imagine being dropped into a mountainous area and searching for diamonds. You are running short of food and water, and must find more in order to survive and continue your search for the treasure. All this must be accomplished in *Survival* within a prescribed time limit.

The game features displayed elapsed time, changing from day to night and also recording weather changes. There are nine levels of difficulty with the higher levels presenting more hazards, including some formidable predatory creatures. The adventure is text only, however, it does have sound effects, and the background screen color changes. Vocabulary is limited. This adventure should be mapped, and it is best to do so on the easiest levels (diamonds are present only on the higher levels). You can save the game at any time, at which point and score will be given.

Survival, in short, has its high points.

Adventure Games

ADVENTURE

Company: Compu-ware

Language: Assembly

Hardware Requirements: 32K, disk drive or cassette player

Department: Entertainment

Sugg. Retail: \$24.95 disk/\$19.95 cassette

Availability: 9

Disk or Tape: Both

OVERALL RATING	A +	DIFFICULTY	A	ORIGINALITY	A
PUZZLE QUALITY	A	EASE OF USE	A	DOCUMENTATION	B
TEXT QUALITY	A	VOCABULARY	B	HOLDS INTEREST?	A
GRAPHICS QUALITY	N/A	SAVE/RESTORE	A	VALUE FOR MONEY	A

Adventure is the Granddaddy of all adventure text games. It was originally written in Fortran in the mid-1970's for the Digital Equipment PDP-11 series of computers by Crothers and Wood. In it, you confront a unique world consisting of 130 rooms, 15 treasures, 40 objects useful to your quest, and 12 obstacles.

The computer represents your eyes and hands, dutifully responding to your two word instructions as to which direction to go, and when and how to manipulate the objects you encounter. *Adventure* starts with a message: "You are standing at the end of a road before a small brick building. Around you is a forest. A small stream flows out of the building and down a gully." After describing what you can see, the computer awaits your order to enter the nearby building or go off to the (N)orth, (S)outh, (E)ast, or (W)est. With any kind of luck, you'll find your way to an enormous underground cavern (which is beautifully described). The many rooms and passageways contain treasures for you to find, a variety of none-too-savory inhabitants to outsmart, and pitfalls to be avoided. Violence and the warding off of monsters are not a major part of *Adventure*, but you can manage to kill yourself if you aren't careful. The snares are not random between games; and once you learn how to deal with the trolls, dwarves, the dragon, the pirate, and so forth, you will be better prepared for your next inevitable bout with them.

Adventure is highly addictive. It definitely should be mapped by all adventurers. Many hours can be spent obtaining ALL the treasures, and in attempting to become a Grand Master, after which you are borne off on the shoulders of the cheering elves. "Winning" depends upon your perspective, but the score is accumulative as you progress. Sometimes you receive points for solving a particular puzzle, enabling you to reach a new passage in the cavern; but points are primarily accumulated for finding treasure and returning it to the building. The game, which can literally take days to play, can be saved at any point.

This game is definitely a classic. The adventure is very logical and very enjoyable to play. While it may not be a beginner's game, it can certainly be played by patient and persevering adventurers of all levels of skill.

WARLOCK'S REVENGE

Company: Synergistics Software

Language: Atari BASIC

Hardware Requirements: 40K, disk drive.

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 5

Disk or Tape: Disk

OVERALL RATING	C -	DIFFICULTY	C	ORIGINALITY	C
PUZZLE QUALITY	C	EASE OF USE	B	DOCUMENTATION	D
TEXT QUALITY	B	VOCABULARY	D	HOLDS INTEREST?	C
GRAPHICS QUALITY	C	SAVE/RESTORE	B	VALUE FOR MONEY	C -

Wizard is an uncomplicated and straightforward adventure game. The objective is to find all the treasures within the four linked, but otherwise independent game segments. The game utilizes black and white, Hi-Res drawings as you traverse your way through the dungeon.

The game will provide a modicum of challenge in mapping the environment, as all areas must be covered to locate the widely scattered treasures. While this adventure does respond to a very limited vocabulary, it occasionally displays some very frothy text statements (i.e., for a perfect score, "You are a grand exalted whiz bang all time poobah, and a nice guy"). After the first phase, a save-game option is available, which should be used if the player still has four "lives" available for each of the 7 characters he may assume. The balance of the game's challenge lies in proper management and usage of these character types.

All in all, *Wizard* is satisfactory for adventure game beginners, while it can serve to "pass time" for devotees; however, don't confuse it with *The Wizard and the Princess* as far as graphic excellence or thought-provoking challenge is concerned.

STARCROSS

Company: Infocom, Inc.

Language: Assembly

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 8

Disk or Tape: Disk*

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

A
B
B
B

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

A
A
B
N/A

ERROR HANDLING
DOCUMENTATION
HOLOS INTEREST?
VALUE FOR MONEY

B
A
A
A

Starcross is a science fiction, all-text adventure game that continues to offer the quality and enjoyable features expected of Infocom, including the excellent Save-game capability, command parsing, and vocabulary. It's long ago and far away, when suddenly the strident alarm of your one-man spaceship advises you of an uncharted mass in space. Naturally curious, you rendezvous, map the eighty or so locations of the game, and encounter remnants of an earlier alien civilization, including their advanced technology, religious superstition, and past tragedy.

With a few exceptions, the puzzles are more of a singular nature than the interactive kind. While the game is somewhat less difficult than its predecessors in the series, there is a relatively difficult sequence which involves obtaining one of the twelve differently colored control rods. Thereafter, it becomes a matter of following through on the logic of the game, placing the rods in appropriately colored slots, and divining the real purpose of your presence. With luck, you will be accorded the salutation of Galactic Overlord.

Unfortunately, the game ends at its high point, where suddenly everything comes together and all becomes clear. This final scene could have been the basis of a game itself. Along the way, there are several clever side issues; for example, the Ray Gun may be fired at just about anything. Most responses are unique, and frequently have a humorous twist—even when you end up getting killed. Throughout, the true use of the Ray Gun, which is required to successfully complete the game, is neatly disguised.

While the prose is less expansive than in the *Zork* series, the plot and storyline are excellent. Like a good book, *Starcross* stimulates the imagination by not entirely explaining what happened in the generations during which the huge artifact has drifted. It is almost a shame to waste the story on kids, who will simply enjoy it for its puzzles, and who just might embarrass Dad with some questions about the periodic tables, Newton's Third Law, and solar system basics.

CRYPTS OF TERROR

Company: Inhome Software

Language: BASIC

Hardware Requirements: 16K; disk drive or cassette player.

Department: Entertainment

Sugg. Retail: \$29.95 cassette / 34.95 disk

Availability: 4

Disk or Tape: Both

OVERALL RATING
PUZZLE QUALITY
TEXT QUALITY
GRAPHICS QUALITY

C+
B
C
C+

DIFFICULTY
EASE OF USE
VOCABULARY
SAVE/RESTORE

B -
C
C
C

ORIGINALITY
DOCUMENTATION
HOLDS INTEREST?
VALUE FOR MONEY

A
C
C
C -

Crypts of Terror is a Real Time adventure game. Its goal is to find the Magic Ring of Power in one of the treasure chests in the fifty Crypts, and return it to Crypt One. If you do so, you will learn the secret keyword to the next level of difficulty.

The game is the typical slug-it-out-with-the-monsters game in which you need to find enough treasures and supplies in the various chests to remain alive and complete your quest. There is a monster in every room that must be killed with a sword or rifle (you need bullets, remember) before you can open a chest. Since you can only carry one item at a time, you must double back and exchange your sword for a key by passing over the item that you wish to carry. You must refrain from pressing the fire button when you want to drop objects. In this game, a map is displayed showing the contents and status of each room. It is available after you have opened a chest. Since plotting all of the items is rather slow, pressing the button is to be avoided.

Life points dwindle rapidly in any encounter with the monsters. Extra life points can be earned by finding food in the chests, or by trading gold coins with the Tree of Life. You must balance fighting with finding enough treasure to sustain life. The game ends once you have lost all three of your men.

The game's concept is good, but the game becomes rather tedious after extended play because it has no puzzle qualities. The graphics and speed are good, considering it is an adventure game written in BASIC.

SCOTT ADAMS' ADVENTURE SERIES

Company: Adventure International

Language: Assembly Language

Hardware Requirements: 32K, disk drive

Department: Entertainment

Sugg. Retail: \$24.95 to \$39.95

Availability: 4

Disk or Tape: Disk

OVERALL RATING	A to C	DIFFICULTY	A to C	ORIGINALITY	B
PUZZLE QUALITY	A to C	EASE OF USE	A	DOCUMENTATION	C
TEXT QUALITY	B	VOCABULARY	B	HOLDS INTEREST?	B+
GRAPHICS QUALITY	N/A	SAVE/RESTORE	A	VALUE FOR MONEY?	A

(Note on Grading: This is a series of 12 games, and the rating above represents an average. The difficulty of Adventures 1-6 is a "C"; Mystery Fun House and the two parts of Savage Island rate an "A" level of difficulty; the Pyramid of Doom is a "B"; Mission Impossible, Golden Voyage, and Strange Odyssey were each given a "C." The Overall Rating of most adventures was a "B," with Strange Odyssey, Mystery Fun House, and Savage Island I leading the pack with two "B +"'s and an "A -," respectively. Savage Island II fared rather less well, given a "C.")

Scott Adams' Adventure Series are puzzle games, each set in a different fantasy adventure scenario. The all-text display states what you can see and where the visible exits are. Two-word instructions lead you through a 20 to 30 cell matrix, permitting manipulations of the various objects you encounter and leading to an eventual solution. The puzzle aspect, much more prevalent than in other adventure games, comes from using the objects to further your progress or avoid being killed. (Doesn't everyone know that a mummy lurking for your throat can be put to sleep by pouring water on his burning terra leaves? You did bring along the water, didn't you? The water was easy to find, but the empty object to carry it in was either somewhere else or hard to find.)

You may be able to solve a game in four to eight hours if you are lucky, clever, and take advantage of the "Save Game" command periodically to avoid having to retrace all the correct steps you make up to the point you were suddenly wiped out. If you enjoy resolving a myriad of interactive, thought-provoking exercises in deductive logic and have the patience of a chess master, it's easy to become helplessly addicted to those challenging games.

The program responses are exceptionally fast and often humorous. Hints and clues, when given, are always obtuse. There are no graphics or sounds, and little use is made of color. As of this printing, the series includes 12 full length adventures, all devilishly devious, delicately intricate, and deceptively involved. One hopes that Scott Adams' imagination will continue to produce more in the series and at his current level of quality.

ADVENTURES 1, 2, and 3

Adventure Land. This game has the distinction of being the first of the good puzzle-adventure games. There are thirteen treasures, above and below ground in this adventure's 29 mappable locations. Some treasures just lie around for the taking, but you may end up a scratching and screaming lunatic before you can truly deal with the bear. Overall, not too difficult, and a good introduction to the tougher games in the series.

Pirate's Cove. You must magically travel between a London flat and an island on your way to locating two treasures. It offers a smooth storytelling style, and its 25 locations are populated by such wacky characters as a talkative parrot, a mongoose that becomes a failure in life, and a drunken pirate who continually wanders off. The task of building a ship on the first island is a good example of a well done interactive puzzle. It is roughly as difficult as *Adventure Land*, in slightly different ways, and fun to play.

Mission Impossible. You must stop the saboteur from bombing the Nuclear Reactor. To complicate matters, you are a walking time-bomb, and the saboteur dies before you get very far. Three differently colored rooms must be entered in a specific sequence in this 21 location game. There's nothing new or particularly difficult here, but things pick up in the last of the rooms, and the game can have either an explosive or rather watery finish.

ADVENTURES 4, 5, and 6

Voodoo Castle. You are assigned the not-so-simple task of removing a curse from the Count Christo. The puzzle takes place in the 24 rooms, hallways, and darkened dungeons of Voodoo Castle. There is a Kachina Doll, a Juju Man, a book for removing curses, and much more. There are a few tricky spots, but the puzzle is solvable. It is very well done and fast moving, with the best story line in the entire series.

The Count. While this game has only 19 locations with which to contend, the new element of time has been introduced. Activities must be time-phased over several days and (parts of) nights in order to kill Count Dracula. It's slightly less complex in format than other games, but unique in that "things change" between night and day, and between successive days.

Strange Odyssey. You're on an alien planet in a damaged spaceship. You need to find five treasures, fix your spaceship, and return to home base. The first four treasures aren't too hard to find, once you figure out how to really move about in the 22 locations of this game. But finding the fifth treasure is a dog of a job, and it might be a pretty cold day before you get it, even after you learn what and where it is.

ADVENTURES 7, 8, and 9

Mystery Fun House. Spies have hidden secret plans that must be retrieved from a carnival Fun House, which consists of 37 locations and a rather messy four-element maze. *Mystery Fun House* is devilishly clever, fun to play, challenging to unravel, and difficult to bring to a successful conclusion. It is tricky to get in, easy to get thrown out, and more than one door may prove frustrating. It's this reviewer's choice for the best of all twelve in the series.

Pyramid of Doom. Thirteen treasures are scattered about in an unexplored Egyptian pyramid. This 26-location game starts out simply enough, but gets very difficult in spots; one treasure, for example, is in a logical spot where you cannot see it, while others are guarded by a stone-hearted Iron Pharaoh. Have fun. And good luck with the Purple Worm!

Ghost Town. The locale is an Old West ghost town, complete with saloon, hotel, telegraph stations, jail, Boot Hill, and a piano-playing ghost. Again, there are 13 treasures to find. It's difficult in some phases, but unique in having a game within a game. Once you've solved this 39-location adventure, try doing so again by finding the optimum sequence of moves that will earn you the maximum bonus. In a typical Adams' switch, there is also opportunity for revenge on the Purple Worm.

ADVENTURES 10, 11, and 12

Savage Island, Part I. If you aren't already familiar with this Adventure series, then this game isn't the one to start with. This one is for aficionados who easily solved *Fun House* and casually breezed through *Ghost Town*! Adams' saga is more devious, treacherous, involved, tricky, and underhanded than ever. *Savage Island* is a long succession of extraordinary puzzles, and entails considerable retracing of steps in and around the island. The object is to obtain the one "password" to permit entry into Part II of this game.

Savage Island is more intricate than most games, and some parts move quickly and easily. The difficulty lies in getting to the easy part, which follows one of the toughest and most intricate sequences that Adams has yet conceived. To help you get into the tough part (before you reach the dinosaurs, UFOs, pirates, and force fields), remember that some sickly animals can be cured with a dose of salts.

Unfortunately, Adams has somewhat flawed a potentially perfect masterpiece by inhibiting the save-game feature during the early, surprisingly difficult part of the game. This, coupled with two very dangerous killers who appear at random (like the Ice Hound of *Strange Odyssey*), often prevents you from getting back to the place you had previously been in order to deal with your tormentors. The resulting frustration kills much of the interest and perseverance required to solve any Adams adventure. It can be done, however; and with the restoration of the save-game aspect, *Savage Island, Part I* could become the type of fun and challenging adventure enigma to lead this excellent series.

Savage Island, Part II. The second part of this game starts out with a bang, so to speak, while displaying the admonition that "Part I was a piece of cake compared to what you are about to go through." Playing was so tough that it required 30 minutes of struggling just for this reviewer to survive the first move, another 30 minutes for two more moves, and another three hours to get up to five moves! Note that Part I must be conquered in order to gain the necessary password to get into Part II (although the reason for this isn't clear, since the games have relatively little in common, except for the Pirate).

Golden Voyage. This game is another matter. It's one of the easiest of Adams' puzzle games almost to the end, and then it becomes only a little harder but a lot more interesting. You are given three days to find the potion required to restore the aged king's youth. It runs a bit slower than earlier games, and as a consequence the upper screen display is quite jerky in updating. The reason for these deficiencies may well be that Adams has used a common assembly language shell for all his adventures, resulting in certain execution inefficiencies, at least in this particular "patched-in" game.

In general, newcomers to Adams' puzzle games would be better advised to cut their teeth on earlier editions; although *Golden Voyage* is close to being complex enough to provide the necessary "training." Even then, the *Savage Islands* are almost too tough, except for the dedicated and somewhat masochistic expert adventurers.

ZORK

Company: Infocom
Language: Assembly
Hardware Requirements: 40K, Disk Drive

Department: Entertainment
Sugg. Retail: \$39.95
Availability: 8
Disk or Tape: Disk*

OVERALL RATING **A+**
PUZZLE QUALITY **A**
TEXT QUALITY **A**
GRAPHICS QUALITY **N/A**

DIFFICULTY **B**
EASE OF USE **A**
VOCABULARY **A+**
SAVE/RESTORE **A+**

ORIGINALITY **A**
DOCUMENTATION **B**
HOLDS INTEREST? **A**
VALUE FOR MONEY **A**

Zork is THE definitive adventure game. Only the original *Adventure* program and the Scott Adams' series are comparable in challenge and complexity. It has the monstrous scope, fundamental tenets, and beautifully descriptive prose of *Adventure*, plus a complex enough "puzzle" structure to warm the heart of any Adams fan.

The scenario is familiar, but the specifics are totally new and different. Not surprisingly, one starts at a deserted house which leads (in hopefully short order) to a cavernous underground complex replete with varied and sundry treasures, a hungry Cyclops, an audacious Thief, a testy Troll, enchanted items (like mirrors and certain knives), an underground lake, dam, and river, to say nothing of the coal mine, chapel, maze, and on and on ad infinitum, even unto the Gates of Hell.

The split-screen, all-text, and silent display is neatly formatted and scrolls very well. The vocabulary is out of this world; by far the most extensive yet encountered. Compound and multiple commands are accepted and individually acted upon. For example, "Take all but shovel and pump. Enter the boat. Examine Scarab" is a valid, single command line. It will even answer a few abstract questions such as "What is xxx?" and "Where is yyy?" Through it all, the speed of the game is satisfyingly fast. Well conceived system commands permit diagnosis of your state of health, control over the degree of text verbosity, enabling/disabling a printer from within the program, and saving a game's status (only one) to a separate disk.

Zork will require at least the same amount of time (or more) than was required to achieve a perfect score in *Adventure*. For those of fainter heart and lesser patience, Infocom's well written documentation advises that a price list is available for various hints and maps. But whether you tough it out or not, the best news is that this is only Part I!

ZORK II

Company: Infocom
Language: Assembly
Hardware Requirements: 32K, Disk Drive

Department: Entertainment
Sugg. Retail: \$39.95
Availability: 8
Disk or Tape: Disk*

OVERALL RATING **A+**
PUZZLE QUALITY **A**
TEXT QUALITY **A**
GRAPHICS QUALITY **N/A**

DIFFICULTY **B**
EASE OF USE **A**
VOCABULARY **A+**
SAVE/RESTORE **A+**

ORIGINALITY **A**
DOCUMENTATION **B**
HOLDS INTEREST? **A**
VALUE FOR MONEY **A**

Zork II comes reasonably close to filling the large shoes left by the first *Zork*. It continues the all-text, split-screen adventure, starting in the Stone Barrow where *Zork I* left off. There are another 400 points worth of treasures to find and tricky activities to accomplish before achieving the primary mission of becoming "Master of the Domain", which is currently under the control of the senile Wizard of Frobozz. Whereas *Zork* was quite faithful to the original mainframe *Zork*, significant changes have been included in *Zork II* to the extent that it is almost a "new" game for players expecting the inclusion of the "second-half" of the mainframe game. The changes are revealed in the inability to return to the White House, although you may get a final glimpse of it, briefly and from afar.

Zork II has the same outstanding command flexibility, wry humor, and word recognition of *Zork*. A well-conceived addition incorporates eight game scenarios which may be saved and quickly recalled at any time, whether you've been killed or not. The overall interest-holding ability may not be as intense as the original possibly due to a certain jaded attitude acquired from too much quantitative adventure game-playing by this reviewer. The initial phase of the contest seems to drag a bit, until the Dragon is conquered and a riddle is completely solved. An especially interesting challenge, at which time a "save" is suggested, occurs at the point in which the demon is ready to do your bidding.

In comparison to *Zork*, this game is somewhat smaller (by about 75 rooms) and has only one small, but unmappable maze, which presents one of the more difficult puzzles. Even after you amass your 400 points, there is still a final puzzle to solve before you become a "Superior Adventurer." At that point, you also learn of the pleasant surprise that *Zork III* is coming!

ZORK III

Company: Infocom, Inc.

Language: Assembly

Hardware Requirements: 40K, disk drive.

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 8

Disk or Tape: Disk*

OVERALL RATING **A+**
PUZZLE QUALITY **A**
TEXT QUALITY **A**
GRAPHICS QUALITY **N/A**

DIFFICULTY **A-**
EASE OF USE **A**
VOCABULARY **A+**
SAVE/RESTORE **A+**

ORIGINALITY **A**
DOCUMENTATION **A**
HOLDS INTEREST? **A**
VALUE FOR MONEY **A**

Zork III completes the classic all-text adventure originally written in 1979 on the DEC PDP-11. Like its predecessors, there is a considerable amount of "new" material incorporated not present in the mainframe version, all written in the graphically imaginative style with which even the Atari's Hi-Res pages cannot compete.

When *Zork III* begins, you are at the bottom of a long staircase (which should strike a responsive chord to those who have completed *Zork II*), equipped only with your lamp and your imagination. At the end, you are in the Treasure Room with all of the treasures of *Zork* at your disposal, including a controlling interest in Frobozzco International. In between, you may hear, or see and hear, the fabled Dimwit Flathead, glimpse into a ritualistic scene from a to-be-hoped-for *Zork IV*, and speak with — or even command — the omniscient Dungeon Master himself. All along the way you will enjoy the excellent save-game implementation, command parser, and vocabulary characteristic of Infocom programs.

Zork III, with its 58 mappable locations (excluding the 8 by 8 matrix "Royal Puzzle"), is slightly smaller than its predecessors; but it is rich in subtle detail. It is perhaps the most entertaining of the three, with very logical, highly interactive puzzles. It is possible to successfully complete the game and still miss much of this detail: you may never find that peculiar set of conditions which can cause a sign to change in its inscription, hinting gently that you may have gone astray. There are numerous, amusingly tongue-in-cheek responses to inputs that otherwise get you nowhere. Overall, the game is somewhat more difficult than *Zork II*, due to several individually difficult puzzles, and also because of their high degree of interaction. You can easily find yourself in a no-win situation, a condition you may not realize until the game is replayed, making alternate life-and-death decisions which are available only once.

The conclusion provides an unexpected and novel twist, but to get that far requires an equally unusual approach as far as most adventures are concerned. Don't count on the seven point score system giving you any real guidance as to your true progress. It is relatively easy to have all seven points and yet find yourself in another no-win situation. The points, like other elements of the game, only prove that things are not always what they seem. Indeed, the toughest puzzles award no points, and several toughies remain unsolved even once all the points have been awarded.

Zork III represents a highwater mark for subtlety and logic, and is a Four Star must, not only for previous *Zorkers* but also for anyone who enjoys adventure games or pleasurable mental stimulation. The game is a separate and complete game unto itself, requiring no knowledge of *Zork I* and *Zork II*. However, for maximum enjoyment and imaginative continuity, it is recommended that they be played in sequence.

PIRATE ADVENTURE SAGA #2

Company: Adventure International

Language: Assembly

Hardware Requirements: 24K, disk drive.

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 7

Disk or Tape: Disk*

OVERALL RATING **B**
PUZZLE QUALITY **B**
TEXT QUALITY **B+**
GRAPHICS QUALITY **B**

DIFFICULTY **C**
EASE OF USE **B+**
VOCABULARY **B**
SAVE/RESTORE **A-**

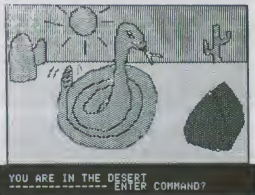
ORIGINALITY **B**
DOCUMENTATION **A**
VALUE FOR MONEY **C**
HOLDS INTEREST? **B**

Pirate Adventure Saga #2 is Adventure International's re-release of their second adventure. As is the case with *Adventureland Saga #1* (see above), *Saga #2* has been dressed up with Hi-Res graphics, and much improved documentation, with a the separate Hint Sheet thrown in to boot. In general, the commentary for *Saga #1* is equally applicable to *Pirate Adventure*.

The game itself is identical in all respects to the play of the original all-text version. There are two treasures to locate and collect, but getting them isn't quite as easy as it may seem. In conjunction with the hint sheet, and since *Pirate Adventure* isn't one of Adam's more difficult puzzles, it is especially recommended for beginning adventurers and young children whose parents are willing to "lose" them for several days.



PIRATE'S ADVENTURE



WIZARD & THE PRINCESS

ADVENTURELAND SAGA #1

Company: Adventure International

Language: Assembly

Hardware Requirements: 24K, disk drive.

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 7

Disk or Tape: Disk*

OVERALL RATING **B**
PUZZLE QUALITY **B**
TEXT QUALITY **B**
GRAPHICS QUALITY **B**

DIFFICULTY **C+**
EASE OF USE **B+**
VOCABULARY **B**
SAVE/RESTORE **A-**

ORIGINALITY **B**
DOCUMENTATION **A**
VALUE FOR MONEY **C**
HOLDS INTEREST? **B**

Adventureland Saga #1 is Adventure International's re-release of its original all-text adventure game which has been spiffed up with Hi-Res graphics, and much improved documentation. Several command option keys have also been added: the "Z" key toggles the graphics mode on and off, speeding the game considerably and producing an all-text version identical to the original release. They've added a four position save-game option, as opposed to the single position on the original version. It is a bit messier to use, however. The documentation is complete with at least a partial list of recognizable key words — a major breakthrough in adventuring.

As before, the object is to resolve the puzzles so that you can find and retrieve thirteen treasures, only some of which are easy to locate. A significant novelty (not evaluated), is that the "V" key toggles a Votrax (if you have one), to provide spoken feedback from the game. The same key was used, however, to toggle a printer and get a running hardcopy of the game text. A dump of the graphics is also possible, provided you have a Grappler or Microbuffer card and an appropriate printer.

The graphics are pleasant and colorful, but are often painfully slow if a number of shape-table objects must be drawn and filled in. "Inventory" is a particularly slow process, after the novelty of watching a graphical "bag-dumping" wears off. This recalls the old expression of "Z" before "I" (or is it "I" before "E"?). The two-sided disk boots off one side, and eventually plays the game there. The flip side of the protected disk, through which one must pass, carries a plethora of AI promotions, including long demos of three games and a multi-screened graphical statement against pirating/unauthorized copying, complete with a dour-visaged Scott Adams staring balefully from the CRT.

If you have played the lower priced text version, you'll find the graphics add little to the enjoyment of the game. Personally, this reviewer preferred the original, as the graphics detract from the degree of imagination that is needed to be successful. If you haven't played the classic AI text adventures, then you'll have a treat in store — graphics or no, these games are a must for any serious adventurer.

THE WIZARD AND THE PRINCESS

Company: Sierra On-Line Systems

Language: Assembly

Hardware Requirements: 40K, Disk Drive

Department: Entertainment

Sugg. Retail: \$32.95

Availability: 8

Disk or Tape: Disk*

OVERALL RATING **B**
PUZZLE QUALITY **B**
TEXT QUALITY **B**
GRAPHICS QUALITY **A**

DIFFICULTY **B**
EASE OF USE **B**
VOCABULARY **B**
SAVE/RESTORE **C**

ORIGINALITY **B**
DOCUMENTATION **C**
HOLDS INTEREST? **B**
VALUE FOR MONEY **A**

The *Wizard and the Princess* may well set a standard by which future graphic adventure games will be judged. As an adventure game, the puzzles are much less involved and devious than the Scott Adams' text games. There are several extremely difficult and illogical hurdles which must be overcome, such as at the very beginning which requires the crossing of several chasms. The Hi-Res graphics are excellent and, with the exception of the initial maze, easily mapped. Color is effectively used, with various stylistic and well-designed shapes for the nearly 100 different primary pictures (not counting variations caused by the presence of objects).

The object is to find and return a Princess who has been bewitched by a wicked wizard and spirited away to his remote castle. It's tough just to get started. You must bypass a coiled snake; and most rocks that you might conceivably use to kill it with are loaded with scorpions. After that, other formidable obstacles must be conquered: a desert, a wide canyon, a wooded beach area, two tropical islands, a rickety bridge, a thieving gnome, a pirate, a giant, a wandering merchant, and a labyrinthine and magical castle. Various objects will be encountered along the way; some are useful, some not, and some are possessed with strange powers.

The game is straightforward and easy to play. Up to 15 different positions may be saved on a scratch disk. Considering the unforgiving and dangerous nature of the terrain and its inhabitants, a frequent "save-game" command is highly recommended in order to catch your breath and regenerate your derring-do.

Both kids and adults will find *The Wizard and the Princess* to be a very entertaining and a somewhat challenging game that will take some doing to successfully conquer. This adventurous rouser may cause some ego-bruising in the family, however, as the game-hardened precocity of youth will probably be the first to solve the problem in getting around the snake.

ULYSSES & THE GOLDEN FLEECE

Company: Sierra On-Line

Language: Assembly Language

Hardware Requirements: 40K, Disk Drive

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 9

Disk or Tape: Disk*

OVERALL RATING **B**
PUZZLE QUALITY **B**
TEXT QUALITY **B**
GRAPHICS QUALITY **A**

DIFFICULTY **B+**
EASE OF USE **B**
VOCABULARY **C**
SAVE/RESTORE **C**

ORIGINALITY **B**
DOCUMENTATION **C**
HOLDS INTEREST? **C**
VALUE FOR MONEY **C**

Ulysses & the Golden Fleece is a Hi-Res adventure game that rivals *The Wizard and The Princess* in overall concept. Your mission is to find and return the Golden Fleece to the King, thereby gaining a kingdom of your own, plus 300 bags of gold and the designation, "Level 2 Adventurer." This mission is fraught with dangers and obstacles before you can ride home with all your riches atop Pegasus.

The game is better-conceived than its immediate predecessors; it is also much harder to solve, in part due to a disturbing lack of recognition of many words, synonymous with text patterns, which the computer will accept. The game also suffers from several bugs and logical shortcomings (e.g., range errors, fireproof wine, inconsistency when reentering rooms where an event or puzzle has previously occurred). The 15 save-game capability on a scratch disk is great; scenarios may be made or called in at any time as long as you are alive — just don't get killed! (Hint: Save the game upon first encountering a major puzzle or obstacle, then restore the saved version at that position after three or four unsuccessful attempts to solve that puzzle; also, don't bypass the Isle of the Sirens, even though it is possible to do so.)

There are almost 150 locations to be mapped, including many near-mazes in jungles, oceans, and forests. The majority of these are cleverly constructed to lead you to the next "correct" location. *Ulysses and the Golden Fleece* is long and difficult but generally maintains one's interest, provided one doesn't get disgusted with the re-booting requirement after being killed and a limited vocabulary.

THE BLADE OF BLACKPOOLE

Company: Sirius Software

Language: Assembly

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING **B**
PUZZLE QUALITY **B**
TEXT QUALITY **C**
GRAPHICS QUALITY **C+**

DIFFICULTY **B-**
EASE OF USE **B**
VOCABULARY **B**
SAVE/RESTORE **A**

ORIGINALITY **C**
DOCUMENTATION **C**
HOLDS INTEREST? **B**
VALUE FOR MONEY **B**

The Blade of Blackpoole is a Hi-Res adventure set in the rivers, lakes, and countryside of a non-specific, medieval magical fantasyland. The object is to find the Sword of Myraglym and return it to its rightful place. Standing between you and success are talking plants and idols, several riddles, a booze-happy monster, a tough-hided lizard, and a variety of ways for you to come to a premature end. A secondary object is to gain the maximum of 500 points for solving the puzzles; it is distressingly easy to receive the final accolade of having your name proclaimed throughout the land only to find that you have but 499 points. While most points come in clumps of about 40 at a crack, the anticlimactic challenge is to find which object is worth that extra point.

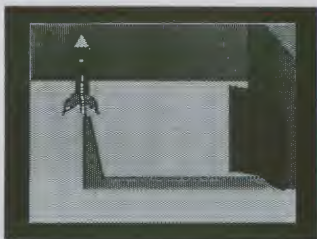
The two-sided game requires only one flip during the boot-up cycle, with the entire game then played (and saved) on the second side. The Assembly Language program is pleasingly fast in its response and color-fill time, even though there is a degree of disk interaction. The game involves 60 locations, including a six room maze. The puzzles are not particularly logical in their solution, but are interactive and so fun nevertheless. The vocabulary and synonym recognition are good, but differentiation between unknown and inapplicable words leaves much to be desired. The command parser permits the use of multiple words, and the save-game implementation permits ten scenarios to be quickly saved or called up at any time. Should you get stuck, the friendly "Help" command may occasionally come through, either with a blatantly obvious or oblique hint.

The principle challenge of the game is inventory management: only 6 of the 23 total objects can be carried at any one time. Several traditional objects (vital in other adventure games) are present, but are not essential in this one. Most have a specific application, while several objects have multiple uses, including one which must be left in a general area in anticipation of its use later in the game. As the game involves two distinct play areas, and returning from the second isn't overly practical, the sequence of property management thus becomes an interesting blend of logic, trial, and error.

While there is nothing novel or innovative in *The Blade of Blackpoole*, and its storyline and graphics are only so-so, it is imaginatively done and fun to play. The overall difficulty level is slightly on the tough side; it is ideal for average adventurers, not too difficult for novices, and yet presents experienced adventurers with an interesting and enjoyable diversion. All in all, *The Blade of Blackpoole* is Sirius's best adventure to date.



ULYSSES & THE GOLDEN FLEECE



MISSION: ASTEROID

MISSION: ASTEROID

Company: Sierra On-Line

Language: Assembly

Hardware Requirements: 40K, Disk Drive

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 8

Disk or Tape: Disk*

OVERALL RATING **B-**
PUZZLE QUALITY **B**
TEXT QUALITY **B**
GRAPHICS QUALITY **A**

DIFFICULTY **C**
EASE OF USE **B**
VOCABULARY **C**
SAVE/RESTORE **C**

ORIGINALITY **B**
DOCUMENTATION **C**
HOLDS INTEREST? **B**
VALUE FOR MONEY **C-**

This is the third of Sierra On-Line's Hi-Res adventure games, and continues in the high-quality tradition of *Wizard and the Princess*. In it, your mission is to destroy an approaching asteroid before it collides with the planet Earth.

The elements of the puzzles are individually easy to solve. In fact, *Mission: Asteriod* is a very easy adventure game, at least right up to almost the very end. The designers let you get tantalizingly close to winning. Emerging victorious is another matter, however. It's a real bear to fit all the necessary elements together within the fixed number of allotted moves. The time limit, at five minutes per move, is of the essence. You're allowed a margin of error of only two moves. When you think you've solved the puzzles, you need to start at the beginning. Saving a game requires an additional move. Also needed is a complete map and, preferably, a written sequence of moves you plan, as things can be easily overlooked with catastrophic results.

All in all, it's a well-done winner, totally straightforward and solvable, even though there may be times when you'll be convinced that you can't "get to there from here!"

PLANETFALL

Company: Infocom, Inc.

Language: Assembly

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$49.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING **B**
PUZZLE QUALITY **B**
TEXT QUALITY **A**
GRAPHICS QUALITY **N/A**

DIFFICULTY **B**
EASE OF USE **A**
VOCABULARY **B+**
SAVE/RESTORE **A**

ORIGINALITY **B**
DOCUMENTATION **A**
HOLDS INTEREST? **A**
VALUE FOR MONEY **A**

Planetfall is a science fiction all-text adventure in which you are an Ensign 7th Class of the Stellar Patrol. You soon find yourself marooned on a planet, uninhabited except for a robot named Floyd. Other than wanting to get back to your Galactic Union, the game's purpose isn't clear until much later, when a computer within your computer provides some much needed detail on various aspects of your newly found world. Along the way, you will find four subsystems to repair, and disease, hunger, and radiation poisoning to overcome before one of the alternative endings makes everything clear. The different endings may indicate that you failed to do something necessary to achieve the optimum solution.

The puzzles are generally clever, but not quite as interactive as other Infocom games. There are several "choke points," particularly early on in the game, that block alternative actions until they have been solved. The vocabulary is quite good, as one expects from Infocom, although it seems that an excess of typing is required at times just to prove the point that the game has a multiple word parser. In some regards, the parser seems restrictive and unnecessary for precise syntax.

Planetfall isn't quite as tight a game as its predecessors; there are numerous rooms in this game that are just window dressing, in which nothing pertinent to the game can be accomplished or learned. To "complement" this, there are a number of red herrings, which, with one exception, are not developed enough to seriously mess you up. Inventory management may be a problem, as there are a plethora of objects to manipulate, many of which are irrelevant and have absolutely nothing to do with the few that are the keys to the game. The puzzle is to determine which is which.

Floyd is a pleasant enough character to have around as a traveling companion, but somehow he's not quite the same show stealer as are several of the robots in *Suspended*. All in all, *Planetfall* is an interesting adventure, suitable for both the novice and for the experienced player, but not quite in the same league as some of the other recent Infocom releases.



DARK CRYSTAL



DARK CRYSTAL

DEADLINE

Company: Infocom, Inc.

Language: Assembly

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$49.95

Availability: 9

Disk or Tape: Disk*

OVERALL RATING

A

GAME CONCEPT

A

CREATIVITY

A

GAME DEPTH

A

CONTROLLABILITY

B

SKILL INVOLVED

A

CHALLENGE

A-

GRAPHICS

M/A

ERROR HANDLING

B

DOCUMENTATION

A

HOLDS INTEREST?

A

VALUE FOR MONEY

A

Deadline is the first in a series of all-text mystery adventure games from the *Zork* bunch. Totally engrossed, you are seemingly pulled directly through the CRT and right into the mansion with the suspects. You, as the Detective, are called upon to investigate the apparent suicide of a wealthy and philanthropic industrialist. There are no monsters, treasures, mazes, wizards, or magicians; just seven characters in a house having some forty-eight mappable locations. Sounds simple? Guess again! There are several tricky puzzles, a very involved plot, an abundance of well-written text, characters moving independently of one another (and of you), a second suicide/homicide of one of the characters (under certain conditions), and the possibility of twenty-five different endings, including your own early demise.

Like any good mystery, *Deadline* unravels slowly, and is complete with false leads and subplots. You have twelve hours to establish your case and resolve the conflicting issues. Don't try to do it all in the first hour; events transpire at specific times which will alter your suspicions or influence your investigation. Because of these events, a complete solution is not possible until early in the afternoon, even if you know exactly what needs to be done. Physical evidence, also time dependent, is hard to come by, despite a multitude of objects.

Regardless of which of four principal suspects you attempt to convict, it is necessary to prove the motive, opportunity, and means. When you believe you have enough proof, you may arrest your suspect(s). A summary letter advises you of the result, ranging from dismissal by the Grand Jury, to conviction by the Trial Jury. Some endings come with shocking suddenness, while others are quite a surprise or contain a strange twist or clue for your next attempt. While some are simply variations of others, there is one "complete" solution, distinguished by a three-screen analysis of the crime by the author.

The game suggests the quality, feel, and humor of its *Zork* predecessors, from which *Deadline*'s flexible, multiple command parser has been adapted. The vocabulary and synonymous word recognitions are excellent, although there are a few "missing" words which a good detective would use; for example, Who, Why, When, and Where. Then, too, there is a fast sequence of events near one ending that is illogical. Lastly, there is an obscure but fatal bug—don't shake a bottle known to be empty unless you have made use of the Save/Restore game feature.

The response time of the game is excellent, and the disk-interactive nature of the game is hardly noticed. *Deadline* will play on a 32K system, run faster on a 48K system, and really zip on a 64K configuration. While the puzzle quality and difficulty level are moderate, the puzzles are quite involved and interactive, requiring more deductive logic than is usually called for in adventures. After seeing the many screens of possible responses and descriptions, perhaps the biggest single puzzle is, how did Infocom manage to get all that text onto one disk?

THE DARK CRYSTAL

Company: Sierra On-Line Systems

Language: Assembly

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING
PUZZLE QUALITY
TEXT QUALITY
GRAPHICS QUALITY

A-
B
B+
B-

DIFFICULTY
EASE OF USE
VOCABULARY
SAVE/RESTORE

C
C-
B
C

ORIGINALITY
DOCUMENTATION
HOLOS INTEREST?
VALUE FOR MONEY

A
B
A
A

The Dark Crystal is a two disk Hi-Res fantasy adventure, the sixth from On-Line and Roberta Williams. The game is based on, and generally faithful to, the movie produced by Jim Henson of Muppet fame, who also wrote the story. The plot is exceptional, but having seen the movie is neither a help nor a hindrance in solving the game.

Jen, our Gelfling hero, is your alter ego. You control his actions in his quest to find and replace the missing shard of the Great Crystal, a deed which must be done at the instant of the triple conjunction of the Three Suns. The great prophecy states that only a Gelfling can accomplish this task, and Jen is one of only two who escaped the slaughter of his race by the evil Skeksis. Failure means that the Skeksis and their robot-like killers, the Garthim, will control their world forever. Success means both the end of the Skeksis rule and a return to peaceful harmony in the world of the Gelfling and Pod people. If he succeeds, Jen will live happily ever after with Kira, the female Gelfling, whom he meets halfway through the game.

The game's disk-interactive graphics, which employ two novel and exciting techniques, are good but not overwhelming. In the beginning, Jen appears a bit too often. In each frame, he is the starkly white character against the colorful, detailed background. Later, after Kira is found, she and Jen neatly overlay the same backgrounds that he had previously traveled alone. Other figures, also all white (presumably due to the overlay requirements), can also occupy the same backgrounds with Jen and Kira on certain occasions. Despite the large game area, mapping, while recommended, is not mandatory. There are no tricks or mazes in the regular, symmetrical layout. There are approximately ninety-four mappable locations at which actions are possible. Also, about a dozen scenes, which automatically appear as a consequence of a previous action, serve as intermediates to the next location. This technique adds materially to both the flow of the story and the fast-action, "animated movie" feeling that comes through in the later phases of the game.

Some liberties had to be taken regarding the movie in order to improve the game's puzzles, which, while not particularly interactive or difficult, demand that you read the text very carefully and use a degree of imagination normally only demanded by an all-text adventure. Some objects and actions are neatly concealed. While you are not too likely to get killed off in the first half of the game, matters get stickier and more dangerous later on. Often only one move is permitted before unfortunate consequences take place.

The syntax permits only two words, but the need for involved expression is not necessary. Similarly, the vocabulary is quite adequate and has good synonym recognition. Only in one spot—toward the end of the game, where several minor glitches are found—is specific word usage a problem (try "Use Hook"). Fifteen different Save-game positions may be made to a scratch disk, which must be initialized from the game disk. While a game may be recalled at any time, it is necessary to reinsert Disk 1B if you get killed off. Combined with the sudden demand to insert another game side, there are often five disk sides with which to contend in a disk-flipping nightmare. This program is sophisticated in many ways; it's too bad that On-Line hasn't learned how easy it would be to optionally permit two drives to be used.

The Dark Crystal has little deliberate humor, but it's lighthearted, done in good taste, and fun to play. The game anticipates your actions and commands unusually well. Quite a number of descriptive responses to the hardest things add materially to making the game playable and interesting, although they have little bearing on the game's solution. The game is easy enough for beginners and captivating enough for more experienced adventurers. Despite a few rough edges, it is one of the best Hi-Res adventures to come along for some time.

CYBORG

Company: Sentient Software, Inc.

Language: BASIC

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$32.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING **A-**
PUZZLE QUALITY **B**
TEXT QUALITY **B**
GRAPHICS QUALITY **C**

DIFFICULTY **B**
EASE OF USE **B**
VOCABULARY **B-**
SAVE/RESTORE **B+**

ORIGINALITY **A**
DOCUMENTATION **C**
HOLDS INTEREST? **A**
VALUE FOR MONEY **B+**

Cyborg is an imaginatively written, all-text science fiction adventure game. You must guess the object, which doesn't become clear until late in the game following a surprising arcade-like (and very effective) Lo-Res graphics interlude. At the outset, all you know is that you are a Cyborg, half-human, half-robot. Having an unusually cohesive plot, the game is more like a novel than an adventure.

Cyborg is big, similar in size to Michael Berlyn's first game, *OO-Topos*. There are 130 mappable locations, including two maze-like areas. Mapping is required; each area must be explored (in ten directions) as the text does not always indicate the exits. The text, while generally well written, is distractingly excessive in some spots. Except for the Droid, the text has little humor or sidelights. The twenty-eight or so objects are well scattered, but do not present a difficult inventory management problem. Many of them are either eaten or worn. The well laid-out screen display, obtained by entering Full Scan (one of four scan types available), clearly shows your inventory, what is being worn, and a description of your location.

One of the game's challenges is its sheer size; you must find the proper sequence to successfully attack it. To get off on the right track, consider using SW, S, D, and E as your first four moves. The actual puzzles are few—more would detract from the novel-like nature. Several, however, are difficult, and clues are limited to the remarks of the small Droid (that comes close to stealing the show), although a Help command occasionally comes through. With the exception of clearing the Cargo Hold, the puzzles are not too involved or interactive. The puzzles are usually logical, but who ever heard of a Cat's Cradle playing Iguana?

The game is disk interactive, but is a little slow for a text game. The two-word syntax is supported by a generally adequate vocabulary. A single Save-game may be written to or called from the protected disk at any time, although a three-scenario capability would have better fit the size of the game. Fortunately, with the exception of the Lo-Res area of the game, it is relatively difficult to get killed off. Should this happen, the game permits a reincarnation—not far from where you are killed, with your objects remaining at the site of your demise—which effectively adds another Save-game capability.

All in all, *Cyborg* is an interesting challenge, dominated by the "what, where, and why am I?" theme, and a well-developed plot with a few surprises and twists along the way. The game is highly recommended for the intermediate to advanced adventurer; the puzzles, definitely secondary to the excellent plot, are made difficult by the size of the game.

SUSPENDED

Company: Infocom, Inc.

Language: Assembly

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$49.95

Availability: 9

Disk or Tape: Disk

OVERALL RATING **A**
PUZZLE QUALITY **A**
TEXT QUALITY **A**
GRAPHICS QUALITY **N/A**

DIFFICULTY **B**
EASE OF USE **A**
VOCABULARY **A-**
SAVE/RESTORE **A**

ORIGINALITY **A**
DOCUMENTATION **A**
HOLDS INTEREST? **A-**
VALUE FOR MONEY **A-**

Suspended is a science fiction all-text adventure game in which you are the central mentality of a planet. Normally, three underground filtering computers keep conditions stable and under control. In an emergency, you may manually control the filtering computer functions to minimize surface casualties, while you repair the damage that woke you from your 500-year sleep. Should the populace suffer drastically while you attempt these repairs, "talking mechanisms" will quickly replace you.

Each robot perceives his surroundings differently; thus, each robot's report regarding the contents of a given room may be wildly different. Only Iris can see, only Auda can hear, and Sensa perceives the state and patterns of

electromagnetic energy. Waldo has a great gift of touch and is handy at fixing things. Whiz can get clues for you from his four-computer peripherals. While not infallible, Poet can touch an object and tell if it is working or not; his "way-out" reports give him a fresh personality that steals the whole show.

The few puzzles, complex and highly interactive, must be solved in a minimum number of moves. The initial puzzle is pretty obvious: Iris can't see. Subsequent puzzles are not so obvious, except that an errata sheet needed to cover a bug advises you that some filtering computer cables must be replaced. Sadly, only one puzzle requires the use of two robots working together; this is regrettable, considering the potential of the concept. After rebalancing the repaired computers, you receive a two-screen conclusion summarizing the casualties and move requirements. You also get a relative efficiency score of one to seven and an appropriate reward, ranging from being burned in effigy to being considered for a home in the country and an unlimited bank account.

The best strategy is to march each robot around and discover his limitations and visualizations; after this, the game will start to make sense. Use the computer peripherals to get information on the objects that are encountered. Then, when you attempt to "solve" the game, watch for opportunities to conserve moves; for example, if you need two robots to arrive at two locations at the same time, order the one farthest from his destination first. As new robots come into play, those commanded earlier will continue toward their specified goal, advising you when they arrive.

After you get a grade of three (savior of the planet) or four (a candidate for a frontal lobotomy), other levels of difficulty await. In Advanced, events move faster and only five of the robots are available to you. In Configure, you define the starting set-up. You can "cheat" a smidge by starting with Iris fully functional and your robots better positioned. In the Impossible mode, it's two moves and zap! To add variety to replays, the computer reset codes change from game to game, or during the game if you try to cheat. A real challenge for the replays would have been to change the color or lengths of the four replacement cables which can be found among the eight used in the system.

Mapping the 61-room complex is not necessary; a nifty map board is supplied. Just take good notes on what each robot sees in each room. The game shares the superlative parser and Save-game feature of the other Infocom adventures; the latter should be used frequently to promote efficiency. Note that a robot must have the "attention" of the area which you wish to investigate more closely. In light of this fact, the fine vocabulary is occasionally marred. *Suspended* has a superb plot, features, and concept; however, the game has not exploited its concept to the extent that it could have.

EMPIRE OF THE OVERMIND

Company: Avalon Hill

Language: Assembly

Hardware Requirements: 40K

Department: Entertainment
Sugg. Retail: \$35.00 disk / \$30.00 cassette

Availability: 6

Disk or Tape: Both

OVERALL RATING
PUZZLE QUALITY
TEXT QUALITY
GRAPHICS QUALITY

C
A
C-
N/A

DIFFICULTY
EASE OF USE
VOCABULARY
SAVE/RESTORE

A
B
C
D

ORIGINALITY
DOCUMENTATION
VALUE FOR MONEY
HOLDS INTEREST?

C
B
D
A

Empire Of The Overmind is an all-text fantasy adventure of the same genre as its predecessor, *Lords Of Karma*, but it is much more extensive and complex. There are 87 mappable locations, many of which are totally dark until you call up the means to light an object. The puzzles are tough, and often you get to within one move before being wiped out. The object is to find and destroy Overmind (a golden sphere), thus winning the love of the enchanted Princess, whom you had previously met while trying to cope with the sundry critters and traps. When this is accomplished, the game ends with a bland page of text, rather disappointing after all the work required to get to that point, and with all the possibilities for a zipper conclusion. The game itself abounds with many objects, helpful people (such as a Dwarf), and several useful magical items. Clues, and the right context in which to use them, are found in the "Rhyme of the Overmind," detailing the history and objective of the game in verse.

While the Rhyme is fairly useful, the Instruction Sheet provides no guidance — except for an easily missed but important comment that three, rather than two words may often be required. The game responds to the first three letters of a word, with the second word often having to be an adjective. To use an object in one's inventory, the command "HOLD" for that object must first be entered, or you'll spend 20 minutes trying to fill the waterskin.

Overmind is written entirely in assembly language. While it isn't disk interactive, it is slow, taking 5 to 12 seconds between commands. All in all, it is a tough and challenging adventure, but is poorly formatted, slow running, and with a minimal vocabulary. It does have a save feature at least to cassette. You'll need to save the game at least once if you expect to complete it.

Board Games

CHESSE 7.0

Company: Odesta

Language: Assembly

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$69.95

Availability: 9

Disk or Tape: Disk

OVERALL RATING

A+

GAME CONCEPT

A

CREATIVITY

B

GAME DEPTH

B+

CONTROLLABILITY

A

SKILL INVOLVED

A

CHALLENGE

A

GRAPHICS

B

ERROR HANDLING

A

DOCUMENTATION

A+

HOLDS INTEREST?

B+

VALUE FOR MONEY

A-

Chess 7.0 is the definitive chess game available on the Apple and Atari computers. While it is difficult to accurately judge its chess rating, it appears to be at least 1650 or more life points. More important to the user, it has a significantly faster response time than *Sargon II* and performs well in the end game—a weakness in most other microcomputer chess games.

This implementation of the ancient strategy game is designed both for ease of use and for teaching the player to improve his game. The pieces on the playing board and all the options displayed at the right side of the board are accessed either by a paddle controller or by moving the right and left keyboard arrow keys. Moves are made first by selecting the desired piece, and then choosing the legal move. Confirmation is by paddle button or the Return key. Only legal moves are shown by the cursor. This is true even if a king is in check and the player wants to move a rook to block it (only the rook's one move that actually blocks the check is allowed). A wrong move can easily be retracted before it is confirmed, but once the piece is actually moved you will have to wait for the computer's response in order to enter the option mode to retract it.

This extension mode allows you to change levels, set up special problems, play "blindfold" chess, save games to disk, retract moves, switch sides, replay all the moves in a game, and get advice on your next move. The computer can even play both sides in a demo game, or play one of forty famous chess games from the past. These are all stored on the disk.

The computer can play at various levels from beginner to advanced. Response time is important in choosing a level of play. Either time-limited or depth-limited levels are available. For example, in the evaluation of this program I used level six—an advanced one—which takes between two and six minutes to look three and six ply (half moves) ahead. Depth-limited levels can range up to eight ply ahead, but this can take from five to twenty hours. There is even a mate finder mode which will look eight moves ahead to solve special end game problems. This also takes several hours. The program does attempt to speed up the response time in the beginning of the game by using an opening library of nearly 4,000 moves. This gives it a definite advantage against any beginner.

I tested *Chess 7.0* against a chess player with a rating of 1800 life points. He played the first game on level four, which looks two to four ply ahead and has an average response time of ninety seconds. He found the program to be a good intermediate opponent with a sound but limited strategy. The computer obviously wasn't looking far enough ahead to anticipate moves; however, it made no genuine blunders. The second game was played on level six, which has an average response time of four minutes and looks three to six moves ahead. Using the Dutch defense as its opening, the program proved to be a very challenging opponent. It was a virtual tie throughout the five hour ordeal. The player finally developed a one pawn advantage by endgame, but because the passed pawn was a rook pawn, it nearly resulted in a drawn game. The computer played exceptionally well. My only complaint was that it still took four minutes to respond to an obvious move, and therefore the game play was unduly slow.

The program comes with excellent documentation. It is logically presented, has clear explanations and diagrams, and offers extensive coverage of the game's history and strategy as well as the computer's programmed strategy. Both beginners and experts will find *Chess 7.0* an exceptional chess program, both as a teacher and an opponent. It is certainly the best chess program that I have seen for any microcomputer.

SARGON II

Company: Hayden

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 7

Disk or Tape: Both

OVERALL RATING

A-

GAME CONCEPT

A

CREATIVITY

B

GAME DEPTH

B+

CONTROLLABILITY

B

SKILL INVOLVED

A

CHALLENGE

B+

GRAPHICS

B

ERROR HANDLING

A

DOCUMENTATION

B+

HOLDS INTEREST?

B

VALUE FOR MONEY

A

Sargon II is one of the best and most powerful chess programs available for the Atari. This game and its earlier version had won most of the microcomputer chess tournaments up until 1981. Only with the appearance of *Chess 7.0* has a microcomputer chess game beaten it.

Sargon II offers six levels of play, detailed board display, the ability to set up chess problems, and a kibitz mode for players who need a suggestion for a better move. The computer's response time is not exceptionally fast on the higher levels of play. While the first level of play takes only 20 seconds, very advanced levels take an hour or more. However, most advanced players would be humiliated at levels with a response time of from two to six minutes.

The program is very easy to use. Initially, the text page and the board can be toggled by the ESC-key, even in the middle of a move. Chess notation is not standard; however, it is perhaps simpler for beginners. The board is lettered horizontally (A-G) and vertically (1-8). Moving the king's pawn two spaces is accomplished by entering E2-E4. Although no hard copy of your moves is made available, the last 20 moves are always displayed on the text page.

Sargon II is a very worthy opponent for any chess enthusiast. It is currently rated at 1400 life points. Because of its style and ease of use, it is one of the better chess programs for the Atari computer.

COMPUTER CHESS

Company: Atari

Language: Assembly Language

Hardware Requirements: 16K, joystick

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 9

Disk or Tape: Tape

OVERALL RATING

B+

GAME CONCEPT

A

CREATIVITY

B

GAME DEPTH

B+

CONTROLLABILITY

A

SKILL INVOLVED

B+

CHALLENGE

B

GRAPHICS

B

ERROR HANDLING

B

DOCUMENTATION

B

HOLDS INTEREST?

B

VALUE FOR MONEY

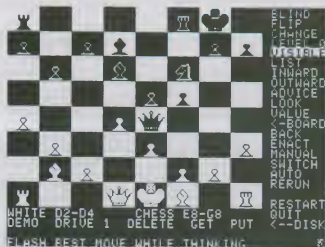
B+

The Atari *Computer Chess* cartridge offers human challengers eight different levels of play, ranging from beginner to expert. The game is played on a green and orange board, with black and white chessmen. You can choose either black or white. Its best feature is the ease with which you can enter moves. Moves are made by positioning the blinking cursor on the piece to be moved, repositioning it on the desired square, then pressing the button to release it there. The computer will not allow illegal moves. If you change your mind before signalling the computer that your move is complete, you can return the piece to its old position, then move another piece. The game permits *en passant* play and castling. To castle, you move the king to the side of the rook, and the computer performs the switch. The game also has the ability to set up a particular situation or chess problem.

Levels one through seven grow progressively more difficult. It takes the computer from 30 seconds to more than ten hours to make a move. It is impractical to play the two highest levels (unless you have months to kill), but level five takes only ten minutes to make a move. There is also a level eight, specially designed for rank beginners. Here, the program takes only fifteen seconds to move.

I played chess on several of the beginner levels; I found that the computer played like a novice, and lost. I'm not a strong enough chess player to test the game at its advanced levels of play. I can comment that I was dismayed when the computer made many obvious mistakes and did not play a good defensive game on levels one and two. Having played against the Apple version of *Sargon II* on the easiest levels, I was very disappointed with *Computer Chess*.

To be fair, a computer chess program must be judged by an expert chess player; or it should be entered in a tournament. Although computer chess programs weren't designed to play against other chess programs, *Computer Chess* didn't do badly in a tournament last year. It is ranked with a chess rating of about 1250. *Sargon II* on the Apple, by comparison, is rated at 1400, and the Z-80/CPM-based *Mychess* is rated at 1600. (Neither is available as yet on the Atari.) In sum, *Computer Chess* can offer a challenge to all but expert chess players on its advanced levels of play.



CHES 7.0



COMPUTER CHES

ODIN

Company: Odesta

Language: Machine

Hardware Requirements: 48K

OVERALL RATING

A

GAME CONCEPT

B

CREATIVITY

B

GAME DEPTH

B

CONTROLLABILITY

A

SKILL INVOLVED

B+

CHALLENGE

A+

GRAPHICS

B

ERROR HANDLING

N/A

DOCUMENTATION

A

HOLDS INTEREST?

B+

VALUE FOR MONEY

A-

The authors of *Odin* wish to offer a program that can teach the intricacies of *Othello* as well as offer a formidable opponent. Formidable isn't the word, for this program plays a devastating game of *Othello*. Fortunately, it offers fourteen levels of play ranging from beginner to super expert, so that players of all skill levels will find it a worthwhile test of ability.

Othello, in case you don't know, is a strategy game played on an 8 x 8 board in which the object is to control the most squares. Each player must place a colored tile on a square that will trap at least one of the opponent's pieces between two of his. All of the opponent's trapped pieces are then "flipped" to his color. The game is simple, but difficult to master.

Odin normally plays against an opponent, but can also be used to monitor play between two players. Input is by keyboard, paddle, or joystick. Turning the paddle, for instance, moves a cursor on the Hi-Res board through all of the positions, or legal moves, and a menu of other options is displayed at the bottom of the screen. Pushing the paddle button chooses a move or selection, if it is an option. The menu, unfortunately, is in the center of paddle rotation. Thus, you move from legal moves to options back to legal moves. This is both unnecessary and confusing.

Most of the menu options were designed for educational purposes. EXPECT shows you what the computer thinks is your best move based on look-ahead analysis of its previous turn. SCORES, on the other hand, shows the relative strengths of all the moves open to you in an immediate analysis. This only tells you the relative number of moves to be gained or lost by your next move. If you're still stumped you can try the MOVE command which will allow the computer to take over your position and make the move. It can teach you that even a hopeless looking position has a solution.

Other useful options allow you either to take back your most recent move, or to replay the entire game from the start. The former, although bordering on cheating, does allow you to test different strategies. If you don't like the results you can take back the move and try something else. You could even use the RESTORE option to take back your move and then have the computer make your move via the MOVE command.

The excellent documentation is well organized; it presents each option in alphabetical order and with screen diagrams. There is a bit of history of the game's evolution and a good discussion of strategy, based on the computer's approach to the game.

Odin is the definitive *Othello* program for both the Apple and Atari computers. Beginners will find it an excellent teacher, and experts will discover it to be a worthy opponent.

REVERSAL

Company: Hayden

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: B

Disk or Tape: Disk*

OVERALL RATING **A -**
GAME CONCEPT **B**
CREATIVITY **B**
GAME DEPTH **B**

EASE OF USE **A**
SKILL INVOLVED **B +**
CHALLENGE **A -**
GRAPHICS **B +**

ERROR HANDLING **A -**
DOCUMENTATION **B +**
HOLDS INTEREST **B +**
VALUE FOR MONEY **B +**

REVERSAL offers the Othello player a definite challenge. In fact, this program by the Spracklens of Sargon Chess fame is a quantum leap over other commercial programs. It won the First International Man-Machine Othello Tournament last year.

It is a strategy game where one must place a piece on a square (8x8 board) that causes at least one of the opponent's pieces to be trapped between your pieces. All of the opponent's trapped pieces are then "flipped" to your color. The object is to control the most squares. A simple game but difficult to master.

The program allows one to play against the computer, play against another human with the computer monitoring the game, or set up a particular board from which to play. There are 27 levels of play, 9 levels for each of beginner, intermediate, and advanced modes. The computer's response time, depending on the level, is from 2.5 sec. to 3 minutes. The board is normally visible, but the escape key will toggle the text page with its play by play listing. There are other features like a kibitz mode where the computer will offer advice (unfortunately the advice isn't very good), a take back feature, and faces on the counters that smile or frown depending on who is winning. (This can be suppressed.)

The computer's move entry is foolproof. A blinking cursor with only the legal moves is operated by the arrow keys. Each press of the key gives another possible move; the return key is used for entry. When the computer makes its move, it waits for you to press return before it actually flips over the pieces.

I found the program especially challenging on the advanced levels; in fact, embarrassingly challenging. Having beaten other programs relatively easily, I was beaten on advanced-level 4 several times by margins of 3 to 1. I settled down to the intermediate level.

QS REVERSI

Company: Quality Software

Language: Machine

Hardware Requirements: 40K, disk drive.

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk: Disk*

OVERALL RATING **A -**
GAME CONCEPT **B**
CREATIVITY **B**
GAME DEPTH **B**

EASE OF USE **A**
SKILL INVOLVED **B +**
CHALLENGE **A**
GRAPHICS **B**

ERROR HANDLING **A -**
DOCUMENTATION **B**
HOLDS INTEREST **B +**
VALUE FOR MONEY **A -**

QS Reversi may well be the "Othello" champion for the Atari. Although the game hasn't been entered in tournaments as yet, preliminary bouts against Hayden's *Reversal*, playing at similar advanced levels based on response times, has resulted in consistent QS *Reversi* victories. The play is brilliant at times, like two masters sparring against each other. I don't know why one can beat the other, but this version obviously has a much more efficient algorithm.

The program's graphics display and input routines are comparable to those of *Reversal*'s. The Hi-Res board is normally visible; but the text page, with its play-by-play listing, can be toggled by Control keys. The move-entry routine is foolproof. Only legal moves, which are displayed via a blinking square whose movement is controlled by the right and left arrow keys, can be entered. The computer waits for you to accept its move before allowing you to continue.

QS *Reversi*, in addition to offering 12 levels of play, allows you to back up one or more moves so that alternative strategies can be tested. It also offers a tournament entry mode, which requires input for specifying the location of the letter column and number row. You can also handicap either the computer or yourself by giving one or more corners away. One last note: although this program can run on a 40K machine, advanced levels 10-12 require a 48K machine.

GO

Company: Hayden Software
Language: Machine
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: \$34.95 disk/\$29.95 cassette
Availability: 3
Disk or Tape: Both

OVERALL RATING	B	EASE OF USE	C+	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	B	DOCUMENTATION	C
CREATIVITY	B	CHALLENGE	B+	HOLDS INTEREST?	B
GAME DEPTH	B	GRAPHICS	C	VALUE FOR MONEY	B

The ancient Oriental strategy game of *Go* has been implemented on the Atari computer. The object of the game is to control as much territory on the board while losing as few of your stones (pieces) as possible to your opponent. The strategy is to place stones on the intersecting lines of the 19 x 19 board so as to completely surround one or more of your opponent's stones without leaving vacant intersections in the closed area. Unlike *Othello*, a somewhat simpler game, captured pieces are removed rather than flipped.

Stones are placed one at a time on the board by either joystick or keyboard control. If you make a mistake it can be corrected in the Edit mode. The computer and its opponent, or two opponents, take turns. While a two-opponent game is played in silence, the computer will sound a warning if it is one stone short of surrounding one or more of your pieces, and the word "Atari," an equivalent to "check" in chess, flashes on the screen. (Incidentally, this is the origin of the name of your computer.)

While the game appears simple in concept, it is difficult to master. The number of stones captured is no indication of how well you are doing since the final score is based on the number of vacant points surrounded *minus* the stones captured by your opponent.

Go is not a very popular game in this country, so it was difficult for me to find a suitable opponent to test the computer's skill level against. However, I can say that the computer opponent is not dumb, doesn't fall for traps, and is certainly above the novice level. It is a challenging opponent and teacher for any beginner who has trouble finding a human opponent.

FASTGAMMON

Company: Quality Software
Language: Assembly
Hardware Requirements: 8K, cassette player.

Department: Entertainment
Sugg. Retail: \$19.95
Availability: 3
Disk or Tape: Tape

OVERALL RATING	B -	CONTROLLABILITY	C	ERROR HANDLING	A -
GAME CONCEPT	B	SKILL INVOLVED	C +	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	B	HOLDS INTEREST?	B
GAME DEPTH	C +	GRAPHICS	D	VALUE FOR MONEY	B -

Fastgammon is a backgammon game in which the computer is your opponent. While its response time and error checking routines are superior, the display is on the text page in board format, but with X's and O's representing the pieces. While it was one of the first Apple games to be translated to the Atari two years ago, it takes no advantage of the Atari's graphics, not even a redefined character set.

The program plays a fair game of backgammon. Although it has a strong midgame, it has a weakness in its end game. Its major strength is its speed of play. One of the most interesting features is its ability to replay a game with the same series of dice rolls. In sum, it is an excellent learning program for beginning to average players, and will provide some challenge and practice for better players.

BACKGAMMON 2.0

Company: Dynacomp

Language: BASIC

Hardware Requirements: 24K, disk drive or cassette player.

Department: Entertainment

Sugg. Retail: \$19.95 cassette / \$23.95 disk

Availability: 4

Disk or Tape: Both

OVERALL RATING C -
GAME CONCEPT B -
CREATIVITY C
GAME DEPTH C +

CONTROLLABILITY C -
SKILL INVOLVED C +
CHALLENGE C -
GRAPHICS C

ERROR HANDLING C -
DOCUMENTATION B
HOLDS INTEREST C -
VALUE FOR MONEY C -

Backgammon 2.0 plays a beginner's level game of Backgammon against a human opponent. The game board is in Graphics 7, with text above and below the game board to identify each piece position with numbers. The playing pieces are more triangular than round. The game is controlled through keyboard inputs. You enter your position choices from and to the place you wish to move, then the computer erases the piece from its current position and redraws it at the new position. It has set up options and gives you the choice of letting you or the computer roll the dice. It plays with the doubling cube, and it plays by standard rules. The computer checks the legality of moves, and whether or not there is an open move, rather swiftly. It seems to have patterned its options after the VCS cartridge.

Keyboard input is an inconvenient arrangement, and withdrawing or changing a move impossible. The program plays a very unchallenging game. It misses very obvious moves at times, and only offers to double when it has a clear win. The graphics are satisfactory, but the level of play will by no means satisfy anyone but novice players.

CHECKERS

Company: Odesta

Language: Assembly

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$49.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING A
GAME CONCEPT B+
CREATIVITY B+
GAME DEPTH A

CONTROLLABILITY A
SKILL INVOLVED A
CHALLENGE A
GRAPHICS A

ERROR HANDLING A
DOCUMENTATION A
HOLDS INTEREST? B+
VALUE FOR MONEY B+

Checkers is an excellent checkers game for the Atari. Played using keyboard, paddles, or joystick, it has 16 levels of play and is suitable for both novice and experienced players. It offers very nice graphics and numerous options. For instance, the program plays against itself, has a sound "off" feature if you want to play in silence, gives advice, can take back a move, and has a replay feature which allows an entire game to be replayed move by move. The lower levels of play are made challenging by the speed of play and the seeming infallibility of the program. The higher levels of play take longer time for a move (about 3 seconds a move at level 5). A feature provided for the true expert (or for the artificial intelligence experimenter) is the capability to change certain parameters that the program uses for decision making.

The program is not without fault. One feature omitted is a save-game option. This could be especially useful at the higher skill levels. The price is also a bit high for the normal checkers dabbler. For the serious player, though, or for someone serious about learning the game, this program is excellent, possibly the definitive checkers game for the Atari.

Sports Games

STAR LEAGUE BASEBALL

Company: Gamestar Software

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$31.95

Availability: 7

Disk or Tape: Both

OVERALL RATING	A	CONTROLLABILITY	A-	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	B+	DOCUMENTATION	B+
CREATIVITY	B	CHALLENGE	A	HOLES INTEREST?	A
GAME DEPTH	B+	GRAPHICS	A-	VALUE FOR MONEY	A

Star League Baseball ranks as the best computer baseball simulation that I have ever seen. The game achieves this through good perspective graphics, simple control, realistic animation and sound, and out and out playability. You can play the game either against the computer or another person. Unlike Coleco's newest cartridge, you play this game on a single screen with the perspective of a person sitting high in the right field stands. This compromise position allows good 3-D perspective of hit balls, which throw a shadow, but sacrifices some of the excitement of the pitching and batting. In particular, the short throwing distance makes it difficult to accurately judge the position of the ball. You need a good eye, a quick trigger finger, and precise timing to hit the ball.

The designers chose a simple control system for the game, well thought out and natural. For example, whenever a ball is thrown to a base, you see the base positions and the infield as if you stood on the pitcher's mound. You push right for second base, up for third, and so on. To avoid confusion in choosing the player who gets the ball, the one closest to the ball takes it (he turns black).

The real heart of the game is the pitching. You can choose three different pitchers at the start of the game, but you cannot change pitchers until the seventh or eighth inning even if they begin to tire. One pitcher throws mostly sliders and screwballs, another curves and sinkers, and the last a good fastball and knuckleballs. You select one of eight possible pitches by holding the button down and getting the pitcher into position. Moving the joystick in one direction specifies the pitch and throws the ball. Frankly, I found it a little hard to tell the pitches apart except in the broad categories of high and low, fast and slow. Some of the balls sink and wobble, but in a very short space and not for very long. If you release the button before the pitcher throws the ball, he comes out of pitching mode and can pick off a base runner.

The poor batter has less control. He can hit any pitch across the strike zone and be rewarded with a cracking sound, but he lacks control of his swing except for the timing. The pitch and the timing of his swing determine the ball's trajectory. If he manages to hit a high pitch, the ball will generally become a high fly ball. Low balls usually become grounders. Slightly early or late timing usually hits a foul ball into the stands if the batter manages to connect. Bunting depends upon pressing and holding the button as the pitch comes in. Once the batter has hit the ball, joystick control moves the lead runner, the others following performance.

The authors not only created an enjoyable game for two players (or one against a tough computer opponent), they also included finishing touches that add realism to the game. The crowd cheers and music plays when tension builds, as when the bases are loaded. The scoreboard sometimes displays trivia questions, scores for other games in the league, and the paid attendance of the game. You can even practice batting, important particularly when you play against the computer. The computer-controlled team fields and tags base runners with smooth skill.

Star League Baseball takes practice to master, especially when learning to throw to third base to stop the advancing runner, or to any base to stop a runner trying to steal. I have played many baseball games on various computers and game systems, but this is the best. While Coleco's two-screen version has better batting and pitching, their game suffers from a grossly over-complicated control system requiring a joystick, four finger buttons, and a keypad. *Star League Baseball* combines the best features from many different games, employs a field perspective suitable for all phases of play, and depends upon a simple control system. The result is a game that a novice can master and enjoy. It may lack the bells and whistles of some of the other games, but it certainly ranks as the most playable and enjoyable baseball game on the market today.



STAR LEAGUE BASEBALL



SOCCER (THORN)

SOCCER

Company: Thorn, EMI

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$44.95

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING **C**
 GAME CONCEPT **C**
 CREATIVITY **C**
 GAME DEPTH **C**

CONTROLLABILITY **C-**
 SKILL INVOLVED **C**
 CHALLENGE **C**
 GRAPHICS **C-**

ERROR HANDLING **N/A**
 DOCUMENTATION **C-**
 HOLDS INTEREST **C+**
 VALUE FOR MONEY **C-**

One to four players can play the classic game of *Soccer* using this cartridge. The game is played on a long field that is three screens wide and scrolls during play. Teams consist of 11 men each, as in the real game; but they are tiny figures and not animated. Each team member can control one player at a time. The player, selected by pressing the joystick button is always the nearest player to the ball. The team number of that player lights up to indicate which player is now controllable. In games with two or more players on a side (up to four players can challenge a computer-fielded team), the nearest player may already have control of the ball, so the computer will choose the next nearest player, and so forth. The player with the ball moves in the direction desired by joystick control. He runs slower than his opponents and must bob and weave to avoid being intercepted and losing the ball. If he wishes to kick or pass, he aims with the joystick and presses the button. Supporting team players are not intelligent unless you are playing with other humans. They don't move into passing position or help in defense, and only shift positions when the screen scrolls. Even the goalie is non-intelligent, and you must transfer control to him either when intercepting the goal kick or when the other team gets very close.

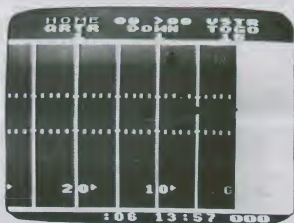
Games with human players on each side tend to be slow, with little field action other than one-on-one play. The offensive player has no one to pass to from midfield on; and since almost all of the players are clustered in a small segment of the field, he has little opposition if he alternates between running and kicking the ball as he moves toward his opponent's goal. It is also difficult to align the tiny player with the ball, so you often miss it when trying to gain possession.

Games against a computer team tend to be lopsided in favor of the computer. While a single player can only control one player at a time, the computer has no trouble moving two or three players simultaneously. There are always two or three players converging on your man with the ball. The best play against the computer is three or four players fielding one team. Incidentally, the computer can play a good exhibition game by fielding two computer teams.

The game is very much a disappointment, particularly if you have played *Soccer* on either the Atari 5200 or the Intellivision. The least one would have expected was some intelligent player positioning support. Instead, you have a static game with single-player movement. The only fortunate thing is that the game improves with the number of players. Four player games are best, because at least you get four-player movement. And four players against the computer makes a very hectic and action-packed game, although four humans can usually overwhelm the less intelligent computer team.



CYPHER BOWL



STARBOWL FOOTBALL

CYPHER BOWL

Company: Artsci

Language: Machine Language

Hardware Requirements: 16K, cassette

Department: Entertainment

Sugg. Retail: \$49.95

Availability: 4

Disk or Tape: Tape

OVERALL RATING

D

GAME CONCEPT

C+

CREATIVITY

C+

GAME DEPTH

C+

CONTROLLABILITY

D

SKILL INVOLVED

C+

CHALLENGE

C+

GRAPHICS

D+

ERROR HANDLING

N/A

DOCUMENTATION

C+

HOLDS INTEREST?

D+

VALUE FOR MONEY

F

Cypher Bowl is an arcade football game for two players. The opponents control five-man teams on a vertically scrolling football field. The game follows the regular rules of American football. The players can choose between pass plays and running plays, and can punt, or kick a field goal.

Each team, depending on whether they are playing offense or defense, can choose between sixteen different plays. A play is chosen in two stages using the joystick. One of four formations can be selected by moving the joystick up, down, left, or right. This method is then followed to pick one of four plays. A chart of these 16 plays is supplied on laminated plastic. They show the running and pass patterns of all players. At first glance, these appear to be unduly complex; but they follow a basic pattern that can and should be memorized for a more enjoyable game. The formation for offense is either a tight left or right, and a split left or right. Obviously, a tight formation gives more protection to the quarterback against the rush since they help to block. The plays are either short or long passes, inside or outside running plays. Defense is somewhat similar, except of course the plays cover the possibilities of the offensive plays.

As a football simulation it has both strong and weak points. The overhead view of players moving up and down the field is very hard to contend with. While it is quite natural to move up the screen, the joystick control is unnaturally backwards when moving down the screen. The overhead view makes pass plays a challenge because of the false perspective. The program allows the player to control the distance the ball is thrown. Although this approach lets the ball pass over the heads of the intervening defensive players, it is extremely difficult to judge how long to hold the button down because you don't see the ball arc in its trajectory. A tonal pitch is supposed to help you tell when the ball is going upwards, but this is little use while steering the fast moving ball with the joystick. The joystick unrealistically allows you to change the course of the ball's trajectory to the point of a full U-turn. Learning to pass is so frustrating that beginners will choose to gain most of their yardage on the ground.

The graphics are chunky and crude. The players are large and not detailed. It seems as if the designers chose graphics mode five, possibly to save screen memory in this 16K game. The ball, which is black, is sometimes difficult to spot when carried by a player. It should have been colored bright yellow or orange for easy visibility against the green playing field. The screen shows approximately half of the field once the game begins. It then scrolls up or down, depending on what happens during the action. From time to time a long pass goes off-screen to an offensive end, but its path is predictable.

Cypher Bowl does have some good points. As a strategic game it is very well designed; and despite its passing game problems is fun to play. Let us hope that some of its better points will be incorporated into a newer version sometime soon that will have improved graphics and a horizontal perspective like that in the Mattel football game.

STARBOWL FOOTBALL

Company: Gamestar Software

Language: Machine

Hardware Requirements: 16K (cassette); (32K disk)

Department: Entertainment

Sugg. Retail: \$31.95

Availability: B

Disk or Tape: Both

OVERALL RATING	B+	CONTROLLABILITY	B	ERROR HANDLING	A
GAME CONCEPT	B	SKILL INVOLVED	B+	DOCUMENTATION	B-
CREATIVITY	B	CHALLENGE	A-	HOLOS INTEREST?	B+
GAME DEPTH	B	GRAPHICS	B+	VALUE FOR MONEY	B+

Starbowl Football is a realistic arcade-style football game for one or two competing players. Each of the opponents control six-man teams in a game that follows American football rules. This sixty minute game takes place on a large horizontally scrolling football field. Players have a choice of passing and running plays, as well as punting or kicking for a field goal.

The designers of this game attempted to make it realistic (as opposed to pure arcade), and they avoided producing a Mattel or Atari clone. Instead, they designed the game on a strategic level where, for example, the ability to complete a pass reflects passing percentages based on split-second timing. A quarterback who holds the ball too long gives the man covering the receiver time to position himself to block the pass. This is much different from Intellivision's football game in which the ability to catch a pass is strictly based on a player's hand-eye coordination in guiding the ball to an open receiver. In *Starbowl Football* the ball is thrown to the receiver and caught by pressing the button at the moment of ball contact. The player covering can maneuver into position for an interception, but he is more likely to be called for pass interference. Penalties add realism to the game. Exceeding the thirty second time limit to choose a play costs five yards for delay of the game.

Whether they are playing offense or defense, each team programs its own play patterns. The offense can choose between four pass patterns and four blocking assignments; it also selects which of two receivers is eligible for the field goal. The choices are input by joystick commands. The instructions are unclear as to the order that the button is pressed for punts versus programming the top receiver for eligibility. To program the top receiver, you briefly press the button, then give the pass play. To punt, you program the top receiver, then press the button. This form of entry causes confusion. Note, too, that you can't fake a punt—they are completely automatic. Likewise, the defensive team can choose between four forms of pass coverage and four rushing patterns.

Starbowl Football has both strong and weak points. To begin with, the game has good graphics. About one-third of the field is seen at one time. As the ball is moved up and down the field, the screen scrolls horizontally. The six players on each team are slightly animated, but they are small and therefore not well defined. Second, the addition of penalties, fumbles, interceptions, and percentages based upon passing plays add realism and strategy to the game: *Starbowl Football* is a realistic football simulation. Third, the computer is a very tough opponent for those who lack a playing partner. On the negative side, the kick off, punting, field goal kicks, and the conversion point are totally automatic. For example, the defensive team stands helplessly by unable to block the kick. Likewise, while it shows perspective as it arcs high into the air, it is automatically caught. Your blockers are useless and it becomes a one-on-one contest in which the quarterback is always caught in the center within a yard or two of the twenty yard line. Speaking of blockers, I find it odd to be able to run the free safety through a solid line of tackles to reach the quarterback. You would think you would have to go around.

Starbowl Football is currently the best football simulation on the market for the Atari 400/800. It is not a Mattel clone, so expect it to play on a more strategic level than on the purely arcade level in which the object is to guide the thrown ball to make your plays.

GRIDIRON GLORY

Company: APX/Atari Program Exchange

Language: BASIC

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$24.95

Availability: 5

Disk or Tape: Disk

OVERALL RATING

B

CONTROLLABILITY

B-

ERROR HANDLING

N/A

GAME CONCEPT

B+

SKILL INVOLVED

B

DOCUMENTATION

B-

CREATIVITY

B+

CHALLENGE

B

HOLOS INTEREST?

B

GAME DEPTH

B

GRAPHICS

B-

VALUE FOR MONEY

B+

Gridiron Glory, a very exciting football game simulation, makes you the coach of any of the NFL football teams. Each team is power ranked for passing, rushing, offense, and defense. Even though the game is written in BASIC, it moves fast. A twenty-five second clock forces rapid play selection and makes for a much more realistic game. *Gridiron* also sports a regular game clock which divides the eight-minute quarters. You even get time-outs and a two-minute warning.

I was impressed by the realistic play features of this game, including referees to call the penalties (you have to constantly watch the referee to learn the outcome of a play), and a statistics counter which keeps track of all yards and points, just like Monday Night Football.

You control your team using different joystick positions and some keyboard commands. The instructions clearly explain the different play and joystick combinations. Some study is required to become familiar with the correct joystick positions. I still play with the instructions opened for reference.

Gridiron Glory also has other good things, like a roaring crowd sound effect when a touchdown is scored. When a game is close, the fourth quarter can really get wild. You will enjoy this game, especially when you are playing against a rookie coach. Here is a tip. Get him or her to coach Baltimore or New Orleans. You take San Francisco.

HOCKEY

Company: Gamma Software

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 5

Disk or Tape: Both

OVERALL RATING

C+

CONTROLLABILITY

B

ERROR HANDLING

N/A

GAME CONCEPT

B

SKILL INVOLVED

C+

DOCUMENTATION

C+

CREATIVITY

C

CHALLENGE

B-

HOLOS INTEREST?

C

GAME DEPTH

C

GRAPHICS

C-

VALUE FOR MONEY

C+

Hockey simulates the sport of ice hockey for two, three, or four players. It is much simplified over standard game play: teams are reduced to four players each — three forwards and a goalie. In two player games, a joystick controls one of the forwards, either the man with the puck, or his opposing guard if you are playing defense. The other two men are monitored by the computer, and manage to follow the flow of the game's action quite well. When the puck is passed, control is transferred to the recipient. If a player from the opposite team touches the puck, he gains immediate control in a clever steal. The goalie is also controlled with the same joystick by means of up and down movements. He cannot hold or catch the puck, only deflect it. All passes or shots at goal are made by pressing the joystick button while pushing the joystick in the direction you want the puck to travel.

The game is a grueling test of endurance in these three, five, or eight minute contests. Action is nearly non-stop except when a goal is scored. Games that end in a tie conclude with a two minute, "sudden death" overtime period. These games are best played with four players, one team member guarding the goal while the other plays forward. Defensive goal keeping is improved when independently controlled; although it is best to switch off since the job of goal keeper is not very exciting.

The graphics and sound in *Hockey* are on the weak side. The players don't look like hockey players; perhaps they more resemble praying mantises. The sound effects are terrible. Noise simulates the cheering crowd throughout the game, and a "blat" sounds when the game or period is ended. The defender guarding the advancing offense player with the puck flashes. He is often hard to see, especially when several teammates are in close proximity. With the offensive passing quickly, this blinking man who is under the player's direct control changes position too often, which makes things confusing for the defense.

On the brighter side, *Hockey* is quite fun to play, especially for sports-minded fans. It is a very competitive contest, sure to relieve the players of some of their everyday, working world anxieties and frustrations.

DOWNHILL

Company: APX/Atari Program Exchange

Language: BASIC

Hardware Requirements: 16K cassette, 32K disk

Department: Entertainment

Sugg. Retail: \$24.95

Availability: 6

Disk or Tape: Both

OVERALL RATING	C		C +	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C -	DOCUMENTATION	C -
CREATIVITY	C	CHALLENGE	C	HOLDS INTEREST?	B -
GAME DEPTH	D	GRAPHICS	C	VALUE FOR MONEY	C

The thrill of downhill ski racing can be had in this game from APX. One player races against the clock in an attempt to ski through a downhill race course consisting of eleven or more gates, and past numerous trees which serve as obstacles. The player steers his man with a paddle controller, and can use the button as a brake if he needs to slow down. The goal is to ski the course in the shortest time without missing any of the gates. A penalty of 10 seconds is added to one's time for each missed gate.

There are four different courses that can be increased in difficulty by changing the steepness of the hill. The beginner's course is the easiest, with the least obstacles; while the expert course is studded with trees with very narrow gaps between them. There is also a random course that resets the gate's positions each time it is played.

The course, which is viewed from above, scrolls vertically from top to bottom as one skis. The skier appears to proceed up the hill rather than down. This doesn't detract much from the game, although it would have been nice to be skiing down the screen rather than up the screen. The skier's dynamics aren't quite like those encountered in real skiing. It normally requires turning sideways to slow down — here you press a button. Also, you can actually ski slightly uphill in a long traverse if you are going fast enough. Recovery after striking a ski gate or tree is maddeningly slow.

Despite the above reservations, *Downhill* is fun to play if you are a skier. It requires good hand-eye coordination and considerable practice. There's also a lot of enjoyment to be had for several players who compete for the fastest time on the course.

BASKETBALL

Company: Atari

Language: Assembly

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 10

Disk or Tape: Cartridge

OVERALL RATING	B	CONTROLLABILITY	B -	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	B -	DOCUMENTATION	C
CREATIVITY	B	CHALLENGE	B -	HOLDS INTEREST?	B -
GAME DEPTH	C	GRAPHICS	B	VALUE FOR MONEY	B

Basketball is a sports cartridge for one to four players, who have the option of competing against each other, or against computer opponents (in all but the four-player mode). The computer will even act as a teammate to one of the players in the three player version.

Basketball players are joystick-controlled. When they come in contact with the ball, they begin dribbling automatically, and thus can move anywhere on the court. You must depress the fire button to shoot a basket. The ball hovers in the player's outstretched hands and oscillates from a low to high position repeatedly. The higher the ball, the longer the shot. The ball can be passed in the three or four-player games, if the recipient holds his button down when the player carrying the ball wishes to shoot. The ball is passed instead.

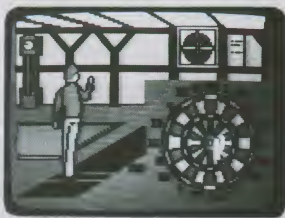
The defensive player can jump and block a shot if his timing is right. He can also harass an opponent who is dribbling and attempt to steal the ball. The steal occurs if the players touch when their feet are exactly aligned on the court.

The graphics are excellent on this almost three dimensional court. The only element that distorts the perspective is the fact that the players don't shrink in size as they move away from the area in the front of the screen. The game is a pleasure to play, even against a computer opponent. The computer plays tough when it is behind or the score is even. But when it pulls ahead more than a few points, it drops into a pattern of predictable play, almost as if hoping to keep the game close. Shooting is very easy with a little practice. The ball almost always travels to the basket, no matter where the player shoots from. Distance is usually the deciding factor in making a basket.

In sum, *Basketball* presents an excellent sports simulation for play on your home computer.



BASKETBALL



DARTS

POOL

Company: Thorn, EMI

Language: Machine

Hardware Requirements: 16K

OVERALL RATING

B -

GAME CONCEPT

B +

CREATIVITY

C +

GAME DEPTH

C +

CONTROLLABILITY

C +

SKILL INVOLVED

B -

CHALLENGE

B -

GRAPHICS

B

ERROR HANDLING

N/A

DOCUMENTATION

C

HOLDS INTEREST?

C +

VALUE FOR MONEY

B -

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Tape

Pool from Thorn, EMI is a nice, straight-forward simulation of the game of pool for one or two players. It offers the games of Eight Ball and Tournament Pool — a game in which you must call your shots, or be penalized. The game has nice, simple joystick control for aiming the cue ball. A cursor points in the direction of the shot. Since there is no fine aim control, you are limited to positioning the cursor by tapping the joystick until it is in the right position against the ball to be struck. However, more precise aim, especially on very close shots, is obtained by just lining the cursor up with the ball. The strength of the shot is determined by a constantly moving "strength of shot" indicator on the left. You take your shot when the indicator reaches your correct value.

The graphics are smooth and nicely done. The table is in green, and each player's balls are a different color. Balls that are pocketed are racked up at the far right. *Pool* is a very easy to play game. While it doesn't enforce the rules, except for scratches, nor has all the bells and whistles of its competition, it's nonetheless a fine game.

POOL 400

Company: Innovative Design Software

Language: Machine Language

Hardware Requirements: 16K

OVERALL RATING

B -

GAME CONCEPT

A -

CREATIVITY

C +

GAME DEPTH

C +

CONTROLLABILITY

C +

SKILL INVOLVED

B -

CHALLENGE

B -

GRAPHICS

B -

ERROR HANDLING

N/A

DOCUMENTATION

B

HOLDS INTEREST

C +

VALUE FOR MONEY

C

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 7

Disk or Tape: Cartridge

Pool 400 is the cartridge version of this company's excellent pool game, *Pool 1.5*. It is similar in control and play, except that it doesn't keep score or enforce the rules. Up to four people can play Straight Pool, Nine Ball, Eight Ball, or Rotation. Control is almost entirely by joystick. Like *Pool 1.5*, you aim the cue ball by moving the joystick from side to side. The cue ball marker shows the projected point of impact. Fine aim is toggled by moving the joystick upward. Both the strength of the shot, and the proper amount of English on the ball are also controlled by joystick. Various keyboard commands allow the players to set the speed of action, the friction, or whether the balls are to be displayed in color or with numbers. They have retained the instant replay feature that allows you to try the same shot repeatedly.

An excellent game. Those pool players who longed for a good pool game simulation, but lacked the computer memory that *Pool 1.5* required, now have their wish.

POOL 1.5

Company: Innovative Design Software

Language: Machine

Hardware Requirements: 48K, disk drive.

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 6

Disk or Tape: Disk*

OVERALL RATING

B

GAME CONCEPT

A-

CREATIVITY

B-

GAME DEPTH

B

CONTROLLABILITY

B

SKILL INVOLVED

B-

CHALLENGE

B

GRAPHICS

B+

ERROR HANDLING

B+

DOCUMENTATION

B

HOLDS INTEREST

C+

VALUE FOR MONEY

B

To simulate the game of pocket billiards accurately with 15 balls and a cue ball bouncing around the table in real time is an incredible feat. The programmer's attention to detail is to be commended. He offers variable friction, strength of shot, type of English on the ball, and four types of pool (straight pool, eight ball, nine ball and rotation).

On the break, or after one's opponent has scratched, one can place the cue ball into position for the shot. Aim is accomplished by a paddle control. A dotted line with the shape of the cue ball's position against the target surface (ball or cushion) is moved about the table. Once a target is chosen, control can be shifted for a finer aim before the shot is taken. While there is a lot of fine adjustment for timing during close shots, it is somewhat less accurate for shots across the table due to the table's angle.

Those who play pool regularly will find the dynamics or physics of the game amazingly accurate. Balls strike and bounce off each other according to Newton's laws of motion. By adding a choice of nine types of English for a shot, one can control the final resting position of the cue ball as in the real game. A nice feature is that if one is practicing a trick shot and misses, the shot can be tried again with all balls in the same place.

The graphics, which are excellent, can be used on either a color or black and white screen. One can toggle between showing the balls with their numbers or in two colors. Actually, on a black and white screen, the colors show up as stripes and solids depending how good your monitor is. The game's instructions can always be reached by toggling the ESCape key. The game comes with a demo mode, with which to break with the friction set to 1 (minimal). The balls seem to bounce around forever until almost every ball is sunk.

DARTS

Company: Thorn/EMI

Language: Machine Language

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Tape

OVERALL RATING

D+

GAME CONCEPT

C

CREATIVITY

D+

GAME DEPTH

C-

CONTROLLABILITY

C

SKILL INVOLVED

D

CHALLENGE

C

GRAPHICS

B

ERROR HANDLING

N/A

DOCUMENTATION

C

HOLDS INTEREST?

D

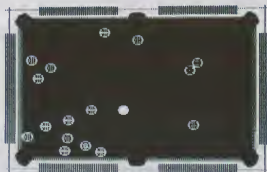
VALUE FOR MONEY

D

Darts allows one to four players to compete in this popular British game. Each player throws three darts per turn at a dart board divided into twenty main scoring sectors (1 through 20). The outer and midway rings score double and treble, respectively. The inner bull scores 50; the outer bull 25. The object is to reduce the players' score from the starting total (301, 501, 901, or 1,001) to zero.

The display shows the back of a dart player facing a dart board across the room. The lower right corner presents an enlarged view of the board. A hand is positioned via joystick to the spot on the dart board that the player wants to hit. The hand trembles slightly to add a bit more challenge and anticipation to the game. The higher the skill level, the more jittery the hand becomes. When you press to throw, the player on the left throws the dart at the dart board. The action is very realistic, and the dart may even strike and bounce off of a wire encircling the board. The score is automatically displayed on the computer's score pad, which alternates with the enlarged dart board after each turn.

The game is quite different from American darts. In some ways it offers a challenge, but it does seem inconsequential to just position your hand on a dart board, then aim and throw a dart. The graphics are good, but the game just isn't much fun to play.



POOL 1.5

GOLF CHALLENGE

Company: Sierra On-Line Systems

Language: Machine

Hardware Requirements: 16K

OVERALL RATING	C-	CONTROLLABILITY	D+	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	D+	DOCUMENTATION	C
CREATIVITY	C-	CHALLENGE	C	HOLDS INTEREST?	D
GAME DEPTH	C	GRAPHICS	C-	VALUE FOR MONEY	D+

Golf Challenge lets one to four players compete on an eighteen hole golf course. Each of the colorful holes has trees, a sand trap, water hazards, and a green. The greens look exactly alike (round), but are shown from different views. Many of the holes have imaginative layouts resembling that of championship courses. You play by moving your joystick-controlled man to the ball, lining up the club, and pushing the joystick left for the backswing. The length of the backswing determines the force of the stroke. You have to learn this through experience. The tricky part is lining up the ball so that the club striking it sends it in the desired direction (the backswing rarely looks right). It takes practice to hit the ball in the correct direction with the correct force.

Unfortunately, *Golf Challenge* doesn't resemble golf very closely, particularly during the stroke. You have no choice of clubs, for example. The ball moves somewhat realistically, bouncing off of trees, moving at half speed in the rough and in sand traps, and stopping dead in the water. If it lands in water, you must hit it again from the last starting position. The game doesn't simulate golf very well, and real golf buffs won't like it.

PRO GOLF

Company: Dynacomp

Language: Basic

Hardware Requirements: 16K

OVERALL RATING	D	CONTROLLABILITY	D+	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C-	DOCUMENTATION	C
CREATIVITY	D	CHALLENGE	C	HOLDS INTEREST?	D
GAME DEPTH	C-	GRAPHICS	D	VALUE FOR MONEY	D

One to four players can tee off on a nine hole golf course in *Pro Golf*. The program uses coarse Graphics Mode 2 characters (20 x 10) to represent the green, trees, sand traps, and water hazards. Each of the holes will appear on the screen with the ball's present location. Information at the bottom of the screen provides current score and club selection. You may select any one of two woods, five irons, or a wedge with the joystick, and hit the ball in one of eight directions by pressing the button. There are penalty strokes for hitting the ball in the water or out of bounds. Shots made out of the rough or sand traps are less powerful than shots hit on the fairway. When the ball reaches the green, the view shifts to a full screen, enlarged view of the ball in relation to the hole. The putt can be long, medium, or short.

The nine hole course is not randomly generated by the program each time the game is played, and thus becomes predictable. There is no fine aiming control, which would have been possible with finer graphics and paddle control. The player must be careful to push the joystick in one of the eight desired directions, or the ball will stray off of the desired course.

Although *Pro Golf* may be the only golf game on the Atari computer at present, it is not very realistic, and does not compare to any of the golf simulations on other micro computers.

Department: Entertainment

Sugg. Retail: \$24.95

Availability: 6

Disk or Tape: Cassette

Department: Entertainment

Sugg. Retail: \$17.95cas./\$21.95 disk

Availability: 3

Disk or Tape: Both

GAMBLING & CARD GAMES

BACCARAT

Company: Dynacom

Language: BASIC

Hardware Requirements: 24K, disk drive or cassette.

Department: Entertainment

Sugg. Retail: \$18.95 Cassette/\$22.95 Disk

Availability: 6

Disk or Tape: Both

OVERALL RATING	D-	EASE OF USE	D	ERROR HANDLING	C-
GAME CONCEPT	C-	SKILL INVOLVED	C-	DOCUMENTATION	B-
CREATIVITY	D	CHALLENGE	D	HOLOS INTEREST?	D
GAME DEPTH	C-	GRAPHICS	C-	VALUE FOR MONEY	D-

Baccarat is the fastest card game in the world. Fortunes can literally change hands in minutes. "Baccarat," and its sister game, "Chemin De Fer," have always had romantic connotations in films and pulp novels. James Bond has confronted and humiliated many a villain at the Baccarat table.

Baccarat is the simplest of all card games, a gambling game similar to "Blackjack." In past years, this game has been popular in Las Vegas casinos. Since it is the only card game where the player is at nearly 50/50 odds with the house, some hard rules have been added by American casinos as to when cards are allowed to be taken by the player and the dealer to shift the odds in favor of the House.

For those unfamiliar with *Baccarat*, player and dealer are dealt two cards; the player with the total closest to nine is the winner. Each player may draw one card to improve his hand and tens are ignored ($12 = 2$, $19 = 9$). This version plays by none of the additional "House" rules, yet manages to play an extremely poor game anyway. It only takes a few simple rules for the dealer to follow. For example, when a player draws a 9 it usually means -1 to his hand (a 4 would end up $3: 9 + 4 = 13 = 3$), and if the dealer had 5 he should stand. Not so in this version. The graphics are bulky, and game control is slow. If you wanted to bet 50, you would have to sit pushing the joystick, and the many delay loops to this BASIC program make it generally uncommendable.

POKERSAM

Company: Don't Ask Software

Language: BASIC

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$24.95

Availability: 5

Disk or Tape: Disk

OVERALL RATING	D	CONTROLABILITY	B	ERROR HANDLING	B
GAME CONCEPT	C+	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	D	CHALLENGE	C	HOLOS INTEREST?	D-
GAME DEPTH	D	GRAPHICS	D	VALUE FOR MONEY	D

They have taken S.A.M. (Software Automatic Mouth, a speech synthesizer requiring no hardware) and merged it with a five card stud poker game to get *Pokersam*, a talking game. The computer narrates each card as it is dealt, announces the bets, and wisecracks between plays. The choice is bet, call, or fold after each card is dealt.

A movie critic once remarked that the test of a 3-D movie is to ask what the movie would be like without the 3-D. Likewise, what would this poker game be without the speech? The answer is, mediocre. First, five card stud tends to be a boring game. Second, the poker portion of the program looks and plays like many of the early poker games out of magazines. This is not to say that it plays poor poker, just that it suggests the same quality. Lastly, blanking the screen during the speech becomes very annoying. The screen goes blank just when you want to look at the cards. In short, *Pokersam* would have made a good demo for the original speech synthesizer, but as a separate game it is not worth the money.

STRIP POKER

Company: Artworx

Language: BASIC

Hardware Requirements: 40K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 5

Disk or Tape: Disk

OVERALL RATING	B-	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	B-	CHALLENGE	C	HOLDS INTEREST?	B
GAME DEPTH	C-	GRAPHICS	A	VALUE FOR MONEY	B-

Strip Poker makes an excellent party game. Several people can take turns in an attempt to win all the clothes off either of two pretty young on-screen opponents who play poker in very different styles. Suzi plays terrible poker. She bluffs continuously, raises a lot, and rarely has a decent hand. Melissa, by contrast, can usually beat the pants off an opponent—if you'll excuse an expression—whose luck isn't with him. Other opponents, both male and female, are now available in supplementary modules, accommodating many tastes.

The object of the game, of course, is to beat either of the two girls in Draw Poker. If either opponent runs out of money to bet with, he or she trades a piece of clothing for \$100. If they win the money back, they may repurchase their clothes. There are either three or four Hi-Res screens; the last shows the girls completely naked.

The cards are dealt to the player and appear beneath the opponent's picture. All choices are made by joystick control, confirmed by pressing the fire button. Players can drop, stay, or bet. They can discard one or more cards in the hope of getting a better hand. The computer doesn't cheat by "looking" at your cards, decent of it given the high stakes of the game.

Overall, the game is entertaining and fun to play, and contains some excellent graphics. It is probably the only computer poker game that holds your interest for more than a few games. It has proved to be a particularly popular game among boys aged 10 to 16 years old. There isn't anything more than they could find in any contemporary girlie magazine, but getting there seems to be more fun. R-rated.

POKER TOURNEY

Company: Artworx

Language: Basic

Hardware Requirements: 32K; disk drive or cassette player.

Department: Entertainment

Sugg. Retail: \$24.95 cassette & disk

Availability: 3

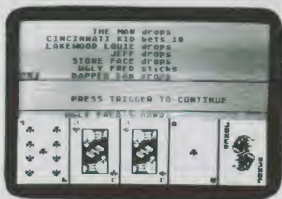
Disk or Tape: Both

OVERALL RATING	C+	EASE OF USE	B	ERROR HANDLING	B+
GAME CONCEPT	B-	SKILL INVOLVED	C-	DOCUMENTATION	C+
CREATIVITY	C	CHALLENGE	C+	HOLDS INTEREST?	C
GAME DEPTH	C	GRAPHICS	C+	VALUE FOR MONEY	C

Poker Tourney simulates the game of draw poker. It is a one-person game pitting you against six other computer players. The deck contains a joker that can be used either as an ace, or to fill in straights and flushes. The rules state that it takes jacks or better to open, and three raises are permitted both before and after cards are drawn. Everyone starts with \$50.00 in chips. Each time a player is forced out of the game the ante and stakes increase. You play until you win or run out of money.

All choices are controlled by joystick input. You can pass, raise, or call; and up to four cards may be discarded. The cards are displayed in colorful, high-resolution graphics if the cassette has more than 32K of memory; otherwise, the cards are in text. The disk version, in addition, contains Hi-Res display.

Each of the computer opponents plays with a different strategy. Some resort to bluffing, others base their play on poker odds. The program tracks your bluffing tendencies and adjusts play accordingly, but it does not cheat by looking at your hand. With features like rotating dealing and escalating stakes, the program plays a very fair yet realistic poker game.



POKER TOURNEY



STRIP POKER

KEN USTON'S PROFESSIONAL BLACKJACK

Company: Intelligent Statements

Language: Machine

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$69.95

Availability: 5

Disk or Tape: Disk*

OVERALL RATING

B+

GAME CONCEPT

B

CREATIVITY

N/A

GAME DEPTH

C

CONTROLLABILITY

B+

SKILL INVOLVED

N/A

CHALLENGE

B+

GRAPHICS

C

ERROR HANDLING

B

DOCUMENTATION

B-

HOLOS INTEREST?

B-

VALUE FOR MONEY

B

Ken Uston's Professional Blackjack is intended to teach the blackjack player three different point-counting strategies that are covered in the author's book *Million Dollar Blackjack*. It is based on the theory that even when the casino is using several decks, the character of the deck constantly swings favor from the house to the player and vice versa. For example, if all four aces have been played, no one can get a blackjack. Since the house pays 3 to 2 for a blackjack, this is unfavorable to the player. Likewise, fives favor the dealer, because house rules require him to hit on sixteen or less.

Those who just want to have fun should learn the simplest of the three strategies. Those who wish to have a good time without losing any money should learn the "simple plus/minus" card counting system, and those who want to make money at it should learn the "Uston Advanced Point Count" strategy.

The program offers several drill sessions where cards are dealt and the player practices his point-counting strategy. This is one of the best blackjack simulations that I have seen. Six players, either human or computer, can sit at any of the six positions at the table. The table can be any casino in the United States. This disk has all of the special rules stored for each casino and plays blackjack by those rules. For example, if you choose to play in the Reno-Lake Tahoe area, you can choose between Harrah's Circus Circus and other local casinos. During play a high tone alerts you when you have made a strategic error. If you press the space bar, you can refresh your memory with the running count, true count, betting true count, and the status of aces. If you just want to play for fun, you can turn off the error prompting sounds.

The disk comes with two separate manuals. The first is a sparse but adequate instruction manual to run the program. The other is a detailed explanation of Ken Uston's point-counting strategies. This book contains valuable colored charts that tell you whether to hit or not depending on your point count and what face card the dealer shows.

This package is higher priced than many other blackjack strategy programs, but it is perhaps the most comprehensive learning tool available to anyone seriously interested in learning to play blackjack for money. Ken is living proof that his strategies work, because he is banned in virtually every casino in the United States where point counting is illegal.

SEVEN CARD STUD

Company: APX/Atari Program Exchange

Language: Basic

Hardware Requirements: 24K cassette; 32K disk.

Department: Entertainment

Sugg. Retail: \$17.95

Availability: 2

Disk or Tape: Both

OVERALL RATING	B -	CONTROLLABILITY	C +	ERROR HANDLING	C
GAME CONCEPT	B -	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C +	CHALLENGE	C	HOLDS INTEREST?	C +
GAME DEPTH	C +	GRAPHICS	B +	VALUE FOR MONEY	B -

In this single player game, you sharpen your wits against five other computer opponents. *Seven Card Stud* is the game, and the computer deals, collects and counts bets, and plays five hands against yours. Each player is given a name and certain traits of poker playing. It becomes your job to learn these traits (for your own poker survival), and, if possible, pile up huge winnings. You can change the "personalities" of your poker rivals around if you like, to prevent yourself from getting too cagey. Fortunately, the computer doesn't cheat by "looking" at your hand.

In different levels of play you can program your opponents in areas of tight or loose play, smart play, frequency of raise, and bluff factors. In all, this makes for many variations of the same game. Whether you call, raise, or fold is determined by positioning your joystick.

The graphics in this game are quite good. Against a green backdrop (giving the effect of a felt tabletop), your checkered cards are dealt three down and four up in the regulation manner. The bets after each card are calculated by the computer, and, after each hand, the tally is shown. You can then look at everyone's hand, and so learn to improve your play. The game ends only when you've had enough of Doc, Kelly, and the rest of the boys.

CRIBBAGE

Company: APX/Atari Program Exchange

Language: BASIC

Hardware Requirements: 40K (disk); 32K (cassette)

Department: Entertainment

Sugg. Retail: \$17.95

Availability: 6

Disk or Tape: Both

OVERALL RATING	C	CONTROLLABILITY	C +	ERROR HANDLING	N/A
GAME CONCEPT	C -	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C -	CHALLENGE	C	HOLDS INTEREST?	D
GAME DEPTH	C -	GRAPHICS	B -	VALUE FOR MONEY	C

Cribbage is a very good rendition of the classic card game in which the object is to be the first to score 121 points by counting combinations of cards (fifteens, straights, pairs, and flushes). It is much more complicated than it sounds, for alternate cards are played with the goal of reaching 31 card points without going over the point limit. The player who succeeds wins the crib in addition to pegging two points. There are other fine points to this game which have made it a popular two-player contest over the years.

The computer is your opponent in this simulation, and an admirable opponent at that. It plays a very steady game with few major errors. There are four levels of play, and the computer plays equally well in each. Scoring is tutored at the novice and beginner's level, while the computer will steal any points that you forget to peg at the advanced level.

The program's basic philosophy is to teach players to correctly score their hands and to develop good playing strategy. Input to the game is entirely by joystick. You choose which card you want to play and move the scoring peg by the touch of the joystick; pauses are controlled by the button. The program is entirely user friendly, and it is virtually impossible to err because the computer will not let you make an illegal card play.

The playfield is nicely laid out with the peg board separating the two opponents. The cards are in Hi-Res (graphics 8). Due to the nature of the graphics mode all card suits are represented by the color blue. Since this is not a game where card suit is important, the singular color doesn't detract from the game. Scoring is displayed both as a numerical value as well as by peg position; the point count is displayed in the center. This is most helpful to beginners who would normally have to count the cards after each play.

This version of *Cribbage* is a very enjoyable one, and it offers all but advanced players a challenge. The program is also a very good tutor for beginners who have trouble learning the intricacies of the game's unique scoring system. Anyone who likes *Cribbage* will enjoy this computerized version.

BRIDGEMASTER

Company: Dynacomp, Inc.

Language: BASIC

Hardware Requirements: 32K, disk drive.

Department: Entertainment

Sugg. Retail: \$21.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING **C+**
GAME CONCEPT **C**
CREATIVITY **B**
GAME DEPTH **B**

CONTROLLABILITY **B**
SKILL INVOLVED **C**
CHALLENGE **C+**
GRAPHICS **N/A**

ERROR HANDLING **D**
DOCUMENTATION **C-**
HOLDS INTEREST? **B**
VALUE FOR MONEY **A**

*Bridge*master is the successor to Dynacomp's *Bridge 2.0* and is the best of the four known Bridge games currently available for the Atari; unfortunately, it still leaves a lot to be desired. *Bridge*master offers 1,000 different hands on a neatly laid out, B&W, all-text playing field; duplicate scoring; and running score sheets for different players. It does not provide a "Claim" feature, so all hands must be fully played out.

The documentation is somewhat long on hype and short on game bidding conventions and menu descriptions. It supports doubles, pre-emptive bids, Blackwood, and Stayman (read the documentation carefully on this one). Given the proper holding, your partner will jump overall or jump shift your opening bid, but he will seldom overall an EW opener, even when holding an opening hand himself. North is not prone to shift suits or support your second rebid of a major, even when holding three small cards. Your North partner loves to bid four card suits — again and again, even if he has two other biddable (and higher ranking) four card suits. He seems to keep bidding on the basis of combined point count, pushing his suit until he reaches the correct level, with the proper suit being left to you as South.

*Bridge*master plays EW hands offensively as well as defensively, but the play is conservative and predictable. When NS is defending, the computer plays the concealed North hand. All closed hands have the unfortunate penchant of leading aces and kings off the top, although an ace may be underled against No-Trump contracts. Against a suit contract, an EW declarer always pulls trump, even at the cost of losing trump control; an offensive cross-ruff algorithm is not provided. The game plays without finesse, so why should you? At least it will usually play second hand low.

The speed of play to each trick is excellent; there is a five second delay after the last card to each trick is played, and a lengthy delay before getting on to the next hand. Preset hands are supported, but can't be saved. *Bridge*master won't take the place of a good instruction book on learning the game; but it is a step in the right direction, and will give a novice good play as well as practice in getting upset with his partner. Intermediate players will be astonished to find that their game has suddenly improved. Advanced players will have to wait awhile for a good challenge.

BRIDGE 2.0

Company: Artworx

Language: Assembly

Hardware Requirements: 24K

Department: Games

Sugg. Retail: \$17.95 cassette/\$21.95 disk

Availability: 8

Disk or Tape: Both

OVERALL RATING **C**
GAME CONCEPT **C**
CREATIVITY **C+**
GAME DEPTH **C**

CONTROLLABILITY **B**
SKILL INVOLVED **C**
CHALLENGE **C+**
GRAPHICS **N/A**

ERROR HANDLING **B**
DOCUMENTATION **C**
HOLDS INTEREST? **C**
VALUE FOR MONEY **C**

Bridge 2.0 allows you to play contract bridge with the help of a computer partner against two other computer opponents. The program consists of two parts: bidding for the contract, and playing out the hand, either as declarer or as defender. This ability to play defense against two computer opponents is rather unique, and this was the first microcomputer program to do so.

The bidding follows Goren's point-count bidding system, but because of memory limitations it only incorporates the most fundamental features. Most of these features are explained in the documentation. Don't expect to be able to change to a third suit if you respond with a bid different from the suit with which it opened. Doubles and No Trump are perfectly acceptable. Overall, the program will respond properly around 70% of the time.

The hand is played out in a text display. The display is nicely formatted, and the cards are arranged by rank and suit for your hand, and for your partner if you are the declarer. A king of diamonds is played by typing KD. The computer opponent isn't very good, lacking finesse in play.

Avid Bridge players will find fault with this program. Apart from the limitations discussed above, the computer cheats. In an attempt to develop an algorithm that could play both offense and defense in a limited amount of memory, it was necessary to allow the computer some knowledge of its opponent's hand. While this may not be fair, the computer still doesn't play very well. The game is much more suited to the novice or average player.

Arcade Style Adventures

IN SEARCH OF THE MOST AMAZING THING

Company: Spinnaker Software

Language: BASIC

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

B
A
A-
A

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

B-
B
B+
C

ERROR HANDLING
DOCUMENTATION
HOLDS INTEREST?
VALUE FOR MONEY

N/A
C-
C+
B-

In Search of the Most Amazing Thing, a game designed for children, departs from the usual kill-the-alien theme, and encourages you to negotiate with the creatures. In order to succeed in finding "the most amazing thing," you must obtain clues from different alien cultures. You must discover how to interact with them, how to read sign language, exchange currency, read maps, and compose songs for which the aliens might wish to trade information.

The journey begins in Metallica, where old Uncle Smokie weaves tales about his past search and offers you the use of his B-Liner for the trip. The B-Liner is a combination hot-air balloon and dune buggy. It is even equipped with an oil-drilling platform on its rear deck so that fuel shortage is never a problem. However, the B-Liner is not fully equipped. You can auction items gathered from Smokie's previous trips to raise money to buy your equipment. The Metallicans, however, are a crafty bunch. If you ask too much, they will steal your item. It becomes a challenge to outfox the aliens at the auction. Since you need a lot of green chips to buy the necessary things, this portion of the game is extremely slow and repetitive. I've been told that some children are completely absorbed by this section. I was bored, and I'm sure older children would be, too.

Once the B-Liner is fully equipped and you have enough clues from Uncle Smokie, you set out on your quest. You fly or drive around the Darksome Mire and get fuel by anchoring against a Night Rock and drilling for oil. To do the latter, you don a jetpack and fly outside to the rear platform. You drive and fly using the AWDX and S cluster keys. You gather food by driving up to a Popberry Tree, flying to its branches, shaking a piece of fruit loose, and scooping it up from the ground before it sinks into the tar.

Flying the balloon takes practice. Winds of various strengths and directions blow at different altitudes. You can only use one instrument at a time. If you are busy monitoring your radar, looking for the nearest hut, and you want to see if you are getting closer, you have to activate a direction display and an altitude display. Each of these takes time to draw. By the time you figure out you are going in the wrong direction, the hut is gone. At this point, an instrument panel would have been useful. Eventually you drift near a hut somewhere in the Darksome Mire, and then you can drive the rest of the way to the hut.

This portion of the game is designed to make you think. First, you have to read the map to determine which land you are in. (The clues offered by the B-Liner's computer modules require the name of the culture.) The clues will give you information about the aliens, such as what the value of their currency is and what music they like. They will also tell you the aliens' sign language (to which the creatures point with their antennae) for six important phrases used in trading. Since music is very important in trading, you are equipped with a music composer. If you can deal successfully with the aliens without offending them or scaring them away, you can trade for a clue to find "the most amazing thing."

While this game is intriguing and educational, it takes innumerable hours to play. Fortunately, it does have a Save-game feature. The average child may not have the patience to play this game due to the time it takes (even days) to find "the most amazing thing." It certainly teaches the child to think, for the instructions only offer some basic clues. A short novel accompanies the package, giving the child some background. All in all, *In Search of the Most Amazing Thing* is an interesting game for a child with a long attention span.

GALAHAD AND THE HOLY GRAIL

Company: APX/Atari Program Exchange

Language: Machine

Hardware Requirements: 32K, disk drive.

Department: Entertainment

Sugg. Retail: \$29.95

Availability: B

Disk or Tape: Disk

OVERALL RATING
PUZZLE QUALITY
TEXT QUALITY
GRAPHICS QUALITY

C
D
N/A
B-

DIFFICULTY
EASE OF USE
VOCABULARY
SAVE/RESTORE

A-
B
N/A
N/A

ORIGINALITY
DOCUMENTATION
HOLOS INTEREST?
VALUE FOR MONEY

B-
D-
B
C+

Galahad and the Holy Grail is a Real Time arcade adventure game in which you, as one of the Knights of the Round Table, venture on a quest to find and return the Holy Grail to the white chapel. It is a very imaginative game, becoming quite obvious as you explore it that the author modeled it after the film adventures of "Monty Python and the Holy Grail." He has included objects like the Holy Hand Grenade, and enemies such as the Rabbit.

The game can be played on two levels of difficulty. The easiest, indicated by a black chapel, does not require you to obtain the various keys that unlock the portals connecting various segments of the adventure. While this may simplify the game somewhat, this game is still incredibly difficult, because of the random Real Time aspects of the puzzling portions of the games. Couple this with an exploration of the adventure maze full of traps and secret portals (found by the minesweep method or blind luck rather than by logic), then you have a very, very tough and frustrating game.

I hate to criticize a creative game, but *Galahad* has features that seem illogical to the player, features not explained in the very sparse documentation. Probably the most irksome aspect is that each time you encounter an enemy knight the item you are carrying magically disappears and a sword appears in your hand. Fine, but where did that item disappear to? Actually, it changes place with the sword. Well, that is nice, assuming you remember where you left the sword. But in reality, since you get killed often (this game allows an infinite number of lives), in the room with the two spiders, for example, items begin to pile up in that room. Another irksome feature is being magnetically pulled into walls if you touch some of them. While at times this may be helpful in reaching some room that you might never have otherwise found, sometimes the wall is deadly and the item that you were carrying becomes embedded permanently (or at least until you reboot the disk). There is no puzzle content to finding anything. It just takes exhausting searching by the minesweep method. I searched the rooms in one castle numerous times and didn't find the secret portal until Atari was nice enough to furnish a complete map and hint sheet to *Galahad*. I must admit that the game makes a lot of sense once you have the map. You begin to realize that there is a way out of that part of the maze if you only searched longer for that secret portal.

Now that I have the map with the locations of all the secret portals, three neighborhood teenagers and myself treat this game as a very frustrating arcade game. While we are sure the game is possible to finish, having spent more than a month trying to kill three knights, two spiders, a very quick rabbit, a deadly dragon, and a lightning fast spider, none of us have succeeded in killing or eluding all in any one lifetime. Each time you are killed you start again at the chapel. We have suffered the frustration of having an enemy knight randomly appear on top of us just as we changed rooms (this is not fair), and rooms scrambled by an exploded hand grenade but with our enemy still alive.

I can't say the game isn't fun or you would question why we are still playing it. But buyers should be aware that the game is exceptionally difficult and challenging, yet flawed in many ways. The documentation leaves a great deal to the imagination. At the least it should have sets of hints for different player levels. I have to hand it to the author for creating a very imaginative game, but the it relies too much on luck and too little on logic to be considered a good adventure game.



GALAHAD & HOLY GRAIL

ACTION QUEST

Company: JV Software

Language: Machine

Hardware Requirements: 16K, cassette or disk drive

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Both

OVERALL RATING	B-	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	B-	SKILL INVOLVED	B	DOCUMENTATION	C
CREATIVITY	B	CHALLENGE	B	HOLDS INTEREST?	B-
GAME DEPTH	C+	GRAPHICS	C+	VALUE FOR MONEY	C+

Action Quest is an action game that attempts to meld the arcade game concept with a maze-adventure format. The goal is to solve twenty puzzles, which are located in six rooms on each of five levels. The puzzles vary in complexity from the simplistic to the very difficult. Most have as goals touching a treasure in a single or linked set of rooms, and then escaping before the clock runs out. These treasures are often guarded by hidden traps or by very fast creatures that can kill on contact.

You play the part of a shimmering ghost, armed with a gun. This gun is useful not only against the paralyzing creatures, but for moving objects around or penetrating barriers. The gun, aimed with a joystick, "remembers" the last position, so that bursts of shots can be fired in the same direction simply by depressing the firing button. Aiming is not as controllable as it should be, especially while defending against two fast-moving creatures approaching diagonally. It takes considerable practice to master the technique of staying alive.

There is a time limit for each puzzle. Your ghost gradually fades to nothing as the timer approaches zero. If you can't exit the room in time, you lose one of your ten "lives." In many cases you can abort the mission just by exiting a doorway and trying again. In one of the puzzles, you must quickly navigate a maze to a door leading into the treasure room before the timer runs out. Of course, there are deadend passages and false doors. One room has objects that must be touched in the correct sequence before you can reach the treasure. Another has walls that close in to crush you. A clue to each puzzle is displayed at the bottom of the screen.

After retrieving all four treasures on the current floor, the game progresses to the next level. However, you can press the select key to reach any higher level that you wish to try. The game's sounds and graphics are fair. The puzzle content is high enough that it will take several hours to retrieve all twenty treasures. Beyond that, you can try for the best time. In sum, while it should not be classified as an adventure, it is a creative game and one that's fun to play.

GHOST ENCOUNTERS

Company: JV Software

Language: Machine

Hardware Requirements: 16K; cassette, or disk drive.

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Both

OVERALL RATING	B	EASE OF USE	C	ERROR HANDLING	N/A
GAME CONCEPT	B-	SKILL INVOLVED	B-	DOCUMENTATION	C
CREATIVITY	B	CHALLENGE	B+	HOLDS INTEREST?	B
GAME DEPTH	B	GRAPHICS	C+	VALUE FOR MONEY	B

Ghost Encounters, an action game that melds the arcade game style with an adventure format, is the sequel to an earlier game, *Action Quest*. In many ways, *Ghost Encounters* is a superior game, because its puzzles are more complex and the ghost can transform itself into any of the tools needed to complete the quest if you press the appropriate key. Sometimes it needs to become a key to open a lock, or a shovel to dig a hole, a thin line to fit through a narrow pipe, or possibly a torch, hammer, or magnet.

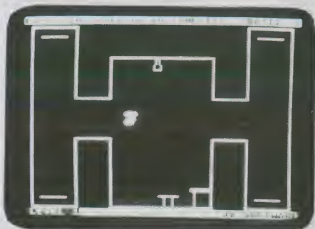
Like its predecessor, the game consists of five levels which contain 20 treasures in thirty rooms. There is a time limit for each of the puzzles, and your ghost will gradually fade to death as the timer expires. If you can't exit in time you lose one of your ten lives, as you do if any creature or object kills you in any room. The arcade-style action requires considerable dexterity to handle the gun, which is somewhat difficult to aim accurately while fleeing.

The puzzles are more complex since your ghost can become a number of useful tools. Some are very obvious, others require some insight to the clue offered in the text window at the bottom of the screen. In one part you enter a maze where two creatures are chasing you. The message appears "always one left." You paralyze the first creature with your gun, only to find that it comes alive when the other is paralyzed. Another room has a trapped Pac Man-like creature that, although deadly if released, can be helpful in obtaining the treasure.

The game is intriguing and fun to play. It should take more than a few hours to solve all of the puzzles. In fact even if you manage to solve all of the puzzles through extensive play, it is unlikely that you can complete all twenty within the ten life game limit. That is an added challenge for the dedicated arcade fun.



JOURNEY TO THE PLANETS



ACTION QUEST

JOURNEY TO THE PLANETS

Company: J.V. Software

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: 29.95

Availability: Machine

Disk or Tape: Both

OVERALL RATING	B+	CONTROLLABILITY	B+	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	B-	DOCUMENTATION	B
CREATIVITY	B	CHALLENGE	B+	HOLOS INTEREST?	B+
GAME DEPTH	B+	GRAPHICS	B	VALUE FOR MONEY	B

Journey to the Planets is the third action-adventure from J. V. Software. In many ways it is much superior to their earlier offerings because of the complexity of the space-navigational puzzles. The object of the game is to capture nine treasures from each of the nine planets in an alien universe. You begin on your home planet where you must find a gun and board your spaceship in order to explore the galaxy. Once the ship blasts off it is guided by joystick. A map showing your ship's location in the 8 x 8 sector universe is toggled with the joystick button. As you travel, the unknown sectors adjacent to your square are mapped, and the planets that you need to explore become visible (each in a different color).

While it is possible to explore the space by trial and error, your ship has only a limited energy supply, so fuel must not be squandered. Speed must also be controlled. There are obstacles in space, and the descent to a planet's surface must be made within the green or yellow safety zones shown on the indicator at the top of the screen. The critical landing phase is often hampered by obstacles or tricky landing sites, so speed must be within the green zone.

A planet's surface is represented in five scenes. Each of the treasures is guarded by creatures, some mortal, others not. Sometimes there is an object (like a cage) that will assist you, but the trick to using it properly is concealed in a cleverly constructed puzzle. Another planet has moving blocks that change color when they are shot, while various color combinations initiate events in another scene. You will obviously need to construct a bridge to reach the treasure, but how do you get the parts? Each of these puzzles is complicated, yet a logical solution is usually available through trial and error. Finally, although you won't readily be killed off, if you do die you are reincarnated back on the home planet ready to try again.

Journey to the Planets is an original and ingenious game with considerable depth. It challenges the adventurer and requires from him a combination of eye-hand coordination skills and problem solving abilities. The graphics are colorful, well animated, and add to the pleasure of playing the game. Joystick control is simple and doesn't complicate or increase the difficulty of the game. Due to the difficulty of some of the puzzles, it won't be solved in a few hours. For those who want a solution, J. V. Software will mail you one for only a dollar. *Journey to the Planets* is a league above the first two adventures in terms of difficulty, and will be a worthwhile investment, especially if you enjoyed the two earlier action-adventures.

CASTLE WOLFENSTEIN

Company: Muse Software

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING	A-	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	B	DOCUMENTATION	B-
CREATIVITY	A-	CHALLENGE	B	HOLDS INTEREST?	B+
GAME DEPTH	A	GRAPHICS	B+	VALUE FOR MONEY	B+

Castle Wolfenstein is a translation of one of the most popular arcade/adventure games on the Apple computer. It was the first of the games to meld the adventure game format with interactive arcade style play. Although it tends to be slow, drawn out, and frustrating, it has remained immensely popular and has a large following.

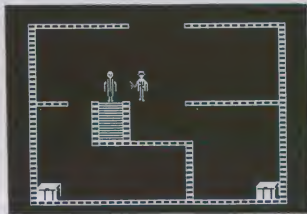
The Germans are holding you prisoner in the dungeons of Castle Wolfenstein. A dying cellmate gives you a gun and ten bullets. Your mission is to find the war plans for Operation Rhinegold, and escape with them from the castle. As you wander from room to room, you will encounter various chests, patrolling guards, and the dreaded SS stormtroopers. Some of these chests contain items that you will need in your quest: a German uniform, a bulletproof vest, schnapps, and, at times, more ammunition and deadly grenades for use against the SS. Be advised that it takes time to open these chests. Also, ammunition can be replenished by searching dead guards.

Your prisoner is controlled by either joystick or keyboard. Touch typists might like the keyboard mode, but it requires a nine key cluster for movement, and a similar one for aiming and firing. The Spacebar is used for searching guards or unlocking doors or chests. The Start key fires the gun, and the Option key propels a grenade. Single joystick mode is perhaps the easiest, since two joysticks require two players to operate them properly. The stick moves your man in the desired direction. When the trigger button is depressed, the man freezes and aims his gun. This arrangement works well since gun play is rarely the quick draw and shoot style, but usually involves an ambush when the guards make their rounds. The guards aren't very bright, however, and are only alerted by gunshots or catching sight of you if you attempt to sneak past.

The strategy involves a systematic search of every room on every floor. A disguise and a bulletproof vest are of great help against the regular guards, but your Mauser will prove ineffective against an SS guard. It's fun to roll a grenade at one and watch him blow up.

While the game is initially fun, it becomes tedious and routine with extended play. There isn't much skill required. Patience in an ambush is much safer than treating the game as if it were an arcade contest. This is especially true if you lose, and so are forced to endure the long opening sequence of instructions once again. Players have been known to cheat when they are captured by quickly opening the drive door and rebooting. Because the disk stores the current room position, this tactic will work. You can play the same game over and over, or you can generate a new and random one which gives you the chance to learn the castle layouts. If you win, you advance to a higher rank and a harder level.

On the whole the game runs smoothly and has few faults, although the long delays to pick the lock on a chest are maddeningly slow, and it is possible to inadvertently find the exit to the castle before you find the plans. The graphics are colorful and nicely animated. The Germans speak several words in their native tongue, but these aren't as clearly understandable as on the Apple because of the DMA of the Atari's graphics chip. Overall, *Castle Wolfenstein* is an enjoyable game that can eat up a considerable amount of your free time.



CASTLE WOLFENSTEIN

E.T. PHONE HOME

Company: Atari, Inc.

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$49.95

Availability: 9

Disk or Tape: Cartridge

OVERALL RATING	D+	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C	DOCUMENTATION	D+
CREATIVITY	D+	CHALLENGE	C	HOLDS INTEREST?	D
GAME DEPTH	C	GRAPHICS	C	VALUE FOR MONEY	D

Atari bought the gamerights to the movie *E. T.* for a reported \$10,000,000 in the hopes of producing a best-selling video game. Unfortunately, a movie that appeals to the emotions doesn't necessarily make a good game. The computer version of *E. T. Phone Home!*, while far better than the VCS version, remains a simple child's game in which the object is to gather parts for a transmitter for *E. T.* to use to phone home. If successful, *E. T.* must then be guided to a secret spot in the forest where his spaceship awaits.

The game is played on a large scrolling map consisting of suburban houses, open fields, and forest areas. A number of scientists and secret agents roam the area in search of the extraterrestrial. As the game begins, *E. T.* telepathically displays the parts he needs to construct his phone. The parts are of different shapes and colors and may be as few as four on the easiest level or as many as ten on the more difficult levels. Only Elliott can detect the pieces as he approaches them. The government men often follow Elliott in the hope that he will lead them to *E. T.*, but they are unaware of the telephone parts unless Elliott is actually carrying them, in which case they will steal the parts and hide them elsewhere. Elliott can either drop the part and run, or retain it and attempt to elude his pursuers by making several quick turns on the maze-like paths.

E. T. can only survive for a limited amount of time. His life-energy, which steadily diminishes throughout the game, is indicated at the top of the screen by a shrinking red line and four flowers. Each time the line vanishes, a flower disappears. The extra stress of telepathy quickly reduces his energy, penalizing players who can't remember which parts they are looking for and need to ask *E. T.* repeatedly. Telepathy may also draw the scientists towards Elliott's house. When *E. T.* finds a phone part that he needs his heart turns red and his energy increases (a blue heart indicates an incorrect phone part). When the transmitter is finally completed, *E. T.* speaks and must then be guided to the secret landing site in the forest without being caught.

The game is easy enough for children (ages 8-12) to play. The easiest level has only four phone parts to find. The scientists and secret agents are troublesome, but they aren't good trackers. Usually the child can return the phone parts to the transmitter before three of the flowers disappear. The worst problem is wandering or being chased too far. If you get lost and have trouble finding Elliott's house again, several parked cars near his home become an added help.

E. T. Phone Home! is a very mediocre game that older children and adults will find disappointing. The graphics are adequate and *E. T.*'s voice is cute, but in these days of speech synthesis such features are unremarkable. The game does have some merit, and if your child is enthralled with the *E. T.* character, then you might want to buy it.

MANIAC MINER

Company: Gentry Software

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$19.95

Availability: 7

Disk or Tape: Both

OVERALL RATING	D-	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	D+	SKILL INVOLVED	D	DOCUMENTATION	D+
CREATIVITY	D-	CHALLENGE	D+	HOLDS INTEREST?	D-
GAME DEPTH	D+	GRAPHICS	D	VALUE FOR MONEY	D

I thought *Maniac Miner* dull and simplistic. You collect rubies, opals, gold, and diamonds that magically appear overhead in one of the four shafts showing on the screen. When you have collected five gems, a Magic Pole appears for you to slide down so that you can mine the next level. Bats and deadly spiders inhabit each mine shaft. You can avoid them by using your joystick to duck, jump, or hover, being careful not to jump too far lest you hit the ceiling and die. The whole thing lacks excitement and challenge and belongs in the closet.

SNOOPER TROOPS #1

Company: Spinnaker Software

Language: BASIC

Hardware Requirements: 40K, disk drive

Department: Entertainment

Sugg. Retail: \$44.95

Availability: 5

Disk or Tape: Disk

OVERALL RATING	B +	DIFFICULTY	C	ORIGINALITY	B
PUZZLE QUALITY	C +	EASE OF USE	A	DOCUMENTATION	B +
TEXT QUALITY	N/A	VOCABULARY	N/A	HOLDS INTEREST?	B
GRAPHICS QUALITY	B	SAVE/RESTORE	N/A	VALUE FOR MONEY	C

An educational program that teaches an organizational approach to deductive reasoning along with a bit of mapmaking doesn't always have to be dull and tedious learning. Spinnaker proves the point with a new series of interesting educational programs called *Snooper Troops*. The first, a mystery called *The Granite Point Ghost* by Tom Snyder, is well suited to students in grades four through eight. Besides the general learning value that it imparts in the process of solving a mystery, it is great fun to play. In fact, many of the parents will become involved solving the mystery too.

The game, in Hi-Res graphics, takes place in the town of Granite Point. The mystery involves a family that has moved into a large mansion in a small town. For several weeks strange things have been happening late at night. Some say the house is haunted, but maybe someone is just trying to give the family a bad scare. Now that a valuable Siamese cat is missing from a locked bedroom, a Snooper Troop detective has been called in on the case. You play the detective.

The detective gets to drive around town in his "Snoomobile," mapping the town as he goes, and taking statements from suspects. He can make telephone calls from booths to suspects, informers, or the infamous Mr. X. He can even snoop or search a suspect's unoccupied home.

The house snooping is possibly the most enjoyable part of the entire game. The houses are dark, but you have a flashlight. When you enter, the screen displays the walls of the house and the clues along with question marks. You must move to the question mark and take a picture with your "Snoomatic" camera, then exit without being caught. It's rare to be caught (you usually plan the search on a night when the suspect is known to be out); but if you are caught, you simply start over the following night.

Each of the suspects has three clues to give, each phone contact another three, and each home searched yields a final three. All are numbered, and you must write them down in your clue book. Additionally, there are special message clues that you get through the "Snoopnet" computer at headquarters, so you must hurry back before the end of the day to pick up your messages. Drive carefully and not too fast, for if you crash, you'll end up losing valuable time at the tow yard.

The mystery is very structured. Once you're ready to make an accusation, you do so. However, you must eliminate every other suspect by identifying the clue that exonerates him or her, and then name the means and motive of the guilty party. This is not a simple guessing game, but a serious challenge for the child.

The game is played on the keyboard using the A, W, D, X keys for steering, the S key for stopping, and the space bar for entering and leaving headquarters, phone booths, and houses. The space bar also turns the flashlight on and off and takes "Snoopshots." As our Snoomobile travels around town, the screens change from one view to the next. Although the game isn't in real time, and is the same each time you play, a clock ticks off the hours and days of the week. Messages interrupt frequently with news and tips. Sometimes I think these messages are distracting, but this is true in all police and detective work. Incidentally, there is no game save option.

The game is exceptionally well-done. It is cute, obviously appropriate for children, and not too difficult. Although this is not geared for a classroom environment, it certainly is useful for teaching the art of solving a mystery in the home.

BURIED BUCKS

Company: Analog Software

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 6

Disk or Tape: Both

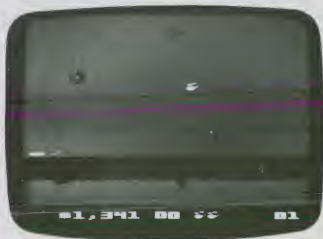
OVERALL RATING	C+	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C+	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	B-	HOLOS INTEREST?	C
GAME DEPTH	C	GRAPHICS	C+	VALUE FOR MONEY	C

Buried Bucks is conceptually interesting as an arcade-style treasure hunt game in which you race against your arch enemy, Dr. Muta, to retrieve buried gold. Dr. Muta thwarts your every effort by dropping tons of dirt from his World War II bomber, causing you to run out of money. The area is so remote that you have to use a helicopter and high explosives to dig for the treasure. With only \$2,000 in working capital, helicopter rental fees of \$240 per minute, and a land use fee for destroying the environment with explosives (at \$1.00 per cubic foot displaced by your blasting), you have to work fast.

The joystick-controlled helicopter is extremely easy to fly. It drops bombs when facing forward, and fires missiles with explosive charges when in a sideways position. Meanwhile, Dr. Muta flies continuously overhead and begins dropping gobs of dirt at the first signs of digging. Therefore, the best strategy is to drop several decoys before pursuing the bucks.

The first level is relatively easy. The treasure isn't buried deeply, and five or six bomb drops below the helicopter are sufficient to uncover it. The helicopter barely fits in the hole, and can quickly recover the bucks before the descending gobs of dirt begin filling in the hole. Remember you only have 75 bombs or missiles, but these are replenished by returning the buried bucks back to your landing site. The second level is more difficult. Here, the treasure is buried deeper and water sites appear. Dropping charges too close to the water only tends to flood the holes, and sometimes water located above the treasure necessitates excavating a large hole at an angle. You could easily get trapped as Dr. Muta fills up the entrance, and by level five your nemesis has resorted to dropping small missile launchers. While you can destroy the launcher on the ground with your missiles, you must outmaneuver the missiles in the air. The game ends when you have lost all of your helicopters or your money.

Buried Bucks is a good game. It plays well and presents a good strategic balance between you and your adversary, and there is very little frustration in the beginning stages when you are just learning how to play the game. Strategy and a lot of ingenuity are required in digging some of the more difficult holes, and while I'd say the graphics and sound are just adequate, the game itself is enjoyable and will prove to hold your attention longer than most.



BURIED BUCKS

PHARAOH'S CURSE

Company: Synapse Software

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 9

Disk or Tape: Both

OVERALL RATING	B+	CONTROLLABILITY	B-	ERROR HANDLING	N/A
GAME CONCEPT	A-	SKILL INVOLVED	B	DOCUMENTATION	B
CREATIVITY	B	CHALLENGE	B+	HOLDS INTEREST?	A
GAME DEPTH	B	GRAPHICS	B+	VALUE FOR MONEY	B+

Pharaoh's Curse is an arcade/adventure in which the object is to recover sixteen treasures from a labyrinth of underground chambers that make up a pharaoh's tomb. The tomb is protected by hidden traps and locked passageways. The ghosts of the Pharaoh, his Mummy servant, and the Winged Avenger stalk the chambers in search of intruders.

Game play requires considerable dexterity, for there is a lot of jumping, climbing, and quick shooting needed to survive. The adventurer, à la Indiana Jones, must leap over snake pits, climb up ropes, and shoot the undead with his gun. He can fall as far as he likes, but traps are everywhere. Also, the Winged Avenger, harmless to the touch, stands ready to carry off the adventurer to the deepest recesses of the tomb.

The sixteen treasures are all represented by markers at the upper left of the screen. These markers will disappear when you obtain a particular treasure, and an extra life will be awarded with each treasure you gain. Once all of the treasures are captured and you exit the tomb, a secret password is given, enabling you to play the more difficult and faster moving levels.

Like most adventures, the game is initially enjoyable when learning the layout of the tomb and the tricks to recovering the treasures. Depending on the arcade skill of the player it will take from several hours to several days to play. It has very good graphics and uses a lot of color on at least sixteen different screens, giving the game considerable depth. While it may not offer the expert a big challenge, it certainly is a fun beginner or intermediate level game, and one that should be extremely popular with those who like the jumping and climbing arcade style games.

MOUNTAIN KING

Company: CBS Software

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

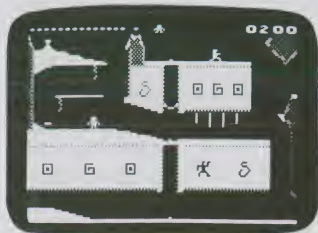
Sugg. Retail: \$39.95

Availability: 6

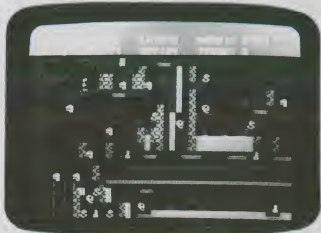
Disk or Tape: Cartridge

OVERALL RATING	D+	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C+	SKILL INVOLVED	C+	DOCUMENTATION	D
CREATIVITY	C-	CHALLENGE	B	HOLDS INTEREST?	D+
GAME DEPTH	D+	GRAPHICS	C	VALUE FOR MONEY	D+

In *Mountain King*, a strange treasure hunt game, you try to steal a crown from the temple chamber located deep within a diamond mine filled with menacing bats. To do this, you must first find the Flame Spirit, which doesn't appear until you have collected a thousand points. You use your flashlight to find the numerous treasure chests, some of which release bats and others which add points to your score. After collecting enough points, you track the Flame Spirit by following its flickering and listening to the volume of the music from *Peer Gynt*. You squat to capture the spirit. Now you can go to the skull directly below, but watch out for the spider. If you squat in the right place, a ladder drops so that you can reach the crown and begin the outward journey. This proves a hair-raising endeavor, one you may not survive. You jump from level to level, sometimes helped by ladders, trying to avoid the bats. This takes dexterity and practice. At the same time, the clock is ticking and the mine is burning while the music plays faster and faster. You'll never get out alive. The first half of the game seems dull and senseless, and the last half, while exciting, can't be completed successfully.



PHARAOH'S CURSE



CAVERNS OF KHAFFA

CAVERNS OF KHAFFA

Company: Cosmi

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$9.95 Tape, \$14.95 Disk

Availability: 3

Disk or Tape: Both

OVERALL RATING	A-	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	B+	DOCUMENTATION	B+
CREATIVITY	A-	CHALLENGE	A	HOLOS INTEREST?	A
GAME DEPTH	A-	GRAPHICS	B	VALUE FOR MONEY	A

Caverns of Khafka, a multi-screen scrolling treasure hunt, consists of four levels through which you search for the treasures of Pharaoh Khafka. You try to reach them without getting lost in the many passageways or succumbing to acid pools, crushing walls, rolling boulders, or deadly bats. The game requires considerable dexterity as you run, duck, and jump your joystick-controlled character through the various passageways and chambers. Upper levels feature poisonous darts, killer bats, and monsters lurking on ladders. You can't kill most of them. The fourth level becomes dark, making it impossible to see some of the dangers, such as the deadly green bricks. This level offers the ultimate challenge.

A number of tricks help you survive your quest, but they take practice. A boat moves across the acid lake, but you must walk with it or die a horrible death. You need to duck constantly to avoid moving floors and walls, which requires timing. To find the secret passageways, you must duck or jump at them. You also need to remember that not all colored walls are harmless. Luckily, you become invincible for a brief period every time you collect ten of the treasures that you need to advance levels. While invincible, you can obtain the more unreachable treasures and kill the deadly bats. It is a good time to clear the passageways. Every twenty treasures, you get a free player. You'll need them.

The animated graphics are very good. Although the cavern remains the same from level to level, it becomes progressively more difficult to pass. You can't jump levels, but pressing Start lets you begin where you left off. Pressing Option starts the game over. You can reach all the treasures, although it takes hours of practice to master the game. I've seen players perform feats that look impossible. Only one thing interferes with the excellent design. The cavern includes two pits, one randomly filled with acid (offscreen). You must jump into one of the pits, which means that you stand a fifty percent chance of losing a man. The only redeeming feature is the fixed location of the acid pit. Otherwise, the design works well. It holds your interest so thoroughly that you may finally make it to level three or even four, and find out what a dark cave looks like.

ZOMBIES

Company: Bram Inc.

Language: Machine

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 4

Disk or Tape: Disk*

OVERALL RATING	C	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C+	CHALLENGE	B-	HOLDS INTEREST?	C
GAME DEPTH	C	GRAPHICS	B	VALUE FOR MONEY	C-

Zombies, an arcade-styled treasure hunt, is set in a three-dimensional dungeon with an oblique view from the top. You try to recover the seven crowns hidden by Wistrik the Evil. Each of the seven dungeons contains ten rooms guarded by zombies, spiders, snakes, and the deadly orbs of evil. Your joystick-controlled character is unarmed, but does have a bag with thirty-two talismans of Rhadamanthus that slow your pursuers for four seconds when strewn in front of them. The talismans become reusable when they disappear. You can also obtain spells by touching any of the scrolls scattered throughout the dungeons. One spell confuses your enemies for four seconds, another freezes them, and the last protects you from harm. Because the creatures inflict damage upon contact, you must have the protective spell or flee lest your life points dwindle to zero. When you succeed in obtaining a crown, you make your way to the screen's edge and the screen scrolls to the next room.

The game has nice background graphics, but little depth of play. It offers no puzzles, nor even a complicated maze to explore. I'm not saying it lacks challenge, but with practice you can get through it in under two minutes. The best feature is the two player option. Two people can cooperate to elude the enemy and collect the treasure faster. One player can't get ahead of the other, because both must exit the screen together.

FORTUNE HUNTER

Company: Romox, Inc.

Language: Machine

Hardware Requirements: 16K Cartridge

Department: Entertainment

Sugg. Retail: \$44.95

Availability: 6

Disk or Tape: Cartridge

OVERALL RATING	C-	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C-	DOCUMENTATION	D
CREATIVITY	C-	CHALLENGE	C	HOLDS INTEREST?	D
GAME DEPTH	C-	GRAPHICS	C	VALUE FOR MONEY	D

Fortune Hunter is a takeoff of the arcade game *Venture*. The object is to obtain a treasure in each of six rooms variously guarded by foes or beset with traps. At the beginning all six rooms appear on a map. When your joystick-controlled man enters a room, the room enlarges to full size.

Each of these rooms has a different set of foes or traps. Touching any of the walls is lethal. The Gold Room has three armed guards who sometimes turn invisible before you can kill them, and another has three moving spikes that prevent you from reaching the treasure in an all-too-narrow alcove. The snakes shoot back in one treasure room; while moving barriers, which require careful timing to defeat, guard the treasure in another room. You can shoot in all directions except directly up and down. This is the only addition which can be said to add a degree of difficulty to the puzzles at all.

Players will find *Fortune Hunter* on the dull side. There isn't much arcade play to the game. Also, you are restricted to only six rooms due to the cartridge size which, in turn, limits the game depth. Similar games like *Ghost Encounters* and *Action Quest* have at least thirty rooms, more variety, and considerably more arcade action. All things considered, this is an expensive cartridge that you will soon put aside after you have mastered the six solutions required to obtain the treasure.

SHAMUS: CASE II

Company: Synapse Software

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 9

Disk or Tape: Disk

OVERALL RATING

A-

GAME CONCEPT

A-

CREATIVITY

B

GAME DEPTH

B+

CONTROLLABILITY

SKILL INVOLVED

CHALLENGE

GRAPHICS

A

B+

A

B+

ERROR HANDLING

DOCUMENTATION

HOLDS INTEREST?

VALUE FOR MONEY

N/A

B-

B

A-

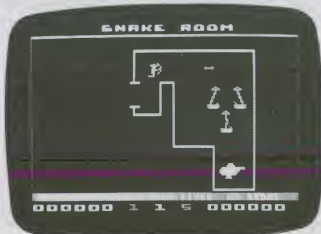
Shamus: Case II is a fast action game which combines characteristics of the arcade shoot-'em-up and graphic adventure. As the Shamus, a futuristic version of a fifties private eye, you battle your way through a maze of underground passages until you reach the lair of your arch-enemy, the Shadow.

Have no fear: the author of the original *Shamus* is not attempting to capitalize on its success with a pale imitation. Aside from the names of the two lead characters, there are few similarities between the two games. The graphics are new, as are the perils you face. These include poisonous snakes, walls of vicious mutant creatures, and ladders with rungs which disappear at just the wrong moment.

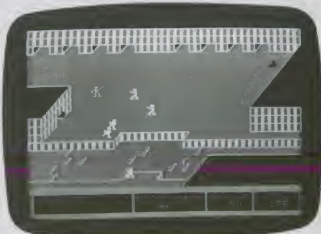
Although strategy is important in *Shamus II*, you will be far better served if you have great reserves of speed and accuracy. You must avoid the horizontally moving snakes, a feat complicated by your inability to stand still on a ladder. In some chambers, you must destroy dozens of mutants before they descend upon you. If they reach the chamber's floor, a segment of the floor will disappear. Lose the last piece of floor, and you will drop through to the chamber below.

Fans of *Shamus* will welcome the inclusion in *Shamus II* of a pause feature. If you press the space bar, a map of the explored cavern areas will appear. This map includes your present location and your goal (with a great deal of empty space between the two). Press the space bar again and return to the battle.

Shamus II is far from a run-of-the-mill rehash of a successful game. It is even more original, exciting, and difficult than its predecessor, almost taking the dread out of the word "sequel."



FORTUNE HUNTER



ZOMBIES

THE SPY STRIKES BACK

Company: Penguin Software

Language: Machine

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$19.95

Availability: 7

Disk or Tape: Disk*

OVERALL RATING	C-	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	D	DOCUMENTATION	C
CREATIVITY	D	CHALLENGE	C+	HOLDS INTEREST?	D+
GAME DEPTH	C-	GRAPHICS	C-	VALUE FOR MONEY	C-

The Spy Strikes Back can be likened to an arcade adventure in which you hunt for nine clues that are hidden somewhere inside a German fortress. These clues lead to the location of Dr. X's terrorist operation.

The fortress consists of five floors, each divided into twenty-four vaulted and guarded sections. Each section contains sixteen smaller rooms where you hide from the electronic guards that patrol the halls. The vaults are sealed from each other in the beginning, but finding a flashing ring will open a door between any two adjacent sections. A flashing elevator inside one of the rooms leads you to another floor. The upper floors are the most dangerous. Since you often need to go down or up a floor to cross over to another section, it is best to map the floors.

Game play is rather mechanical. It is easy to avoid the robot guards by ducking inside a room. However, your bonus is automatically halved once the guard sounds the alarm. Once in a while a spy shape shows up in place of the ring. This is one of the nine clues which altogether form a coded puzzle.

The graphics are mediocre with identical screens throughout, but the program has excellent musical selections that play throughout the entire game and contribute to the fun.

The Spy Strikes Back is an interesting game for those who like to find and decode clues to a puzzle. It offers a diverting challenge to adventurers who aren't looking for a real thinking text or picture-style adventure game.

PROBE ONE: THE TRANSMITTER

Company: Synergistic Software

Language: Atari BASIC

Hardware Requirements: 40K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 9

Disk or Tape: Disk

OVERALL RATING	D+	DIFFICULTY	D+	ORIGINALITY	C-
PUZZLE QUALITY	D	EASE OF USE	B	DOCUMENTATION	D
TEXT QUALITY	D+	VOCABULARY	C-	HOLDS INTEREST?	D
GRAPHICS QUALITY	C+	SAVE/RESTORE	C	VALUE FOR MONEY	C-

Probe One: The Transmitter is a real-time graphics adventure program. Your object is to explore a lifeless Terran outpost and locate and retrieve a prototype matter transmission device. Before the last outpost crewmembers died, they reprogrammed the maintenance robots for defense. These robots make up for their lack of weaponry by sheer numbers. Interaction with the program involves a combination of the computer keyboard and either a joystick or paddle. The joystick or paddle is used to aim and fire your stun gun at the sentinel robots, thus destroying them.

Other than the pesky robots, the only threats to your well-being are non-operational gravity shafts. These shafts can only be seen if you are wearing a pair of goggles found at the outpost. Once you locate the shaft with your goggles, it reappears every time you are in that room, even without the goggles.

Designing an adventure game is not easy. The puzzles need to be sufficiently complex to be interesting, without being so obscure that the average player has no chance. *Probe One* has no such depth. Once you have determined all the facts the instructions should have mentioned but didn't, the only remaining question is whether persistence will win out over boredom.

O'RILEY'S MINE

Company: Datasoft

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING	D+	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C-	DOCUMENTATION	C
CREATIVITY	D+	CHALLENGE	C	HOLDS INTEREST?	D
GAME DEPTH	D	GRAPHICS	D+	VALUE FOR MONEY	F

O'Riley's Mine is a simple, slow-paced treasure hunting game. You steer your miner around the screen as he digs tunnels to reach the various mineral deposits buried in the earth. The problem is that the tunnels gradually fill up with water. In addition, there are monsters dogging your every move, and while you can't shoot them, you can set a dynamite charge to block their way.

Collecting all of the diamond, ruby, coal, uranium, and oil deposits requires planning and strategy. As the water reaches the highest levels of your tunnels, you need to reach all of the low-lying treasure on both sides of the main shaft. You have to work quickly, for your dynamite charged cave-ins won't block the water from rising. If you mistakenly dig too high, the water in the main shaft will rise to block your escape. The game has progressively harder levels, with more monsters and treasures, and you can't exit the mine until you recover all of the treasure.

The simple graphics are colorful, and the field scrolls slightly to accommodate the mine. Although the game is fairly simplistic with little depth, its random placement of treasures will keep you thinking. Despite its simplicity, it might be worth looking at, but not at \$29.95.



O'RILEY'S MINE

Arcade Rescue Games

CHOPLIFTER

Company: Broderbund Software

Language: Machine

Hardware Requirements: 48K, disk drive.

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 9

Disk or Tape: Disk*

OVERALL RATING	A+	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	A+	SKILL INVOLVED	B	DOCUMENTATION	B
CREATIVITY	A	CHALLENGE	B+	VALUE FOR MONEY	A+
GAME DEPTH	B	GRAPHICS	A+	HOLDS INTEREST?	A+

Occasionally an arcade game comes along that is so unique, so well executed, and such a joy to play that it can be considered a masterpiece. *Choplifter* is such a game. The game involves flying a helicopter into the desert in order to rescue sixty four hostages held prisoner in four barracks. One of the barracks has been blown open and sixteen of the prisoners are waiting patiently for your arrival. Unfortunately, tanks are patrolling the area so the hostages are reluctant to stray far from the burning barracks.

Your helicopter (there are three) is warmed up on the heliport next to the post office near the border. The helicopter responds to the up, down, and sideways movements of the joystick. Although helicopters can fly backwards in a limited fashion by pitching the direction of the rotating blades, control is provided for turning the helicopter around in order to aim its guns. Holding the fire button down reverses direction, and a medium long press puts it into tank attack position directly facing you on the screen. The gun is fired by pressing the button momentarily. This one button control system causes problems that the two button approach on the Apple computer avoided. If in the heat of battle against a tank or jet fighter you fire by holding the button just a little too long, the helicopter turns sideways or around completely. This can result in the loss of a helicopter. The helicopter is easy to fly, and impossible to crash on level one.

It is important to set the helicopter down as near to the prisoners as possible without landing on one. The shorter their run to the copter the better, for tanks are always moving up on your position, and you often have to make a quick getaway. It is always best to destroy a tank quickly, but first lure it away from any prisoners still on the ground, for they are often killed by exploding shells.

The animation in these sequences is incredible. These prisoners actually run towards your chopper. The chopper's blades are rotating and the craft is bouncing slightly as if you were gunning the engine in anticipation of a quick takeoff. As the moving tanks lob shells closer to your craft, the exploding shells sometimes kill a running prisoner. When the prisoners are aware of your leaving, or if your chopper is full, they wave goodbye. There is detail in their motion as they run after your hovering helicopter, or as they run from an advancing tank. You'll watch in amazement as your helicopter is hit by an enemy shell just after it lifts off and it turns into a ball of fire and descends as flaming wreckage.

After rescuing as many as sixteen hostages (the copter only holds sixteen), you return to your base and the second level of the game begins. Enemy jet fighter craft guard the airspace above your advancing craft. They turn and bank sharply while firing rockets at your chopper. Sometimes it is best to maneuver into position and try to shoot them down. Just flying along is like being a sitting duck. A quick attack on a barracks usually frees another group of hostages. Rescue is more difficult at this point as missiles can still hit you from above. The only consolation at this point is that enemy aircraft stay on their side of the border. However, on level three, enemy drone air mines that are capable of homing in on your craft don't care what side of the border you're on.

The helicopter is extremely easy to fly. You do have to be more careful of your descent rate on the upper levels or you will crash the copter. The maximum score is obtained by rescuing all sixty four prisoners. Since this is a formidable task, I would consider this a very challenging game. Overall, the concept, graphics, and animation make this a delightful game. If you are seeking something novel and a game that doesn't quickly bore you, then buy *Choplifter*!



CHOPLIFTER



STELLAR SHUTTLE

LUNAR LEEPERS

Company: Sierra On-Line Systems

Language: Assembly

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING	B-	CONTROLLABILITY	B-	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	C+
CREATIVITY	B	CHALLENGE	C	HOLDS INTEREST?	B-
GAME DEPTH	C+	GRAPHICS	B-	VALUE FOR MONEY	B-

The whimsical creatures who populate *Lunar Leepers* hold a number of your companions captive. The object of the game is to rescue your friends from the Leepers and transport them to the safety of the cliffs before they become dinner for these longlegged creatures. The creatures look harmless enough when you approach in your joystick-controlled rescue craft, but don't be deceived; they are quite capable of outjumping any of the Calaveras County jumping frogs. They extend their long legs as if they were spring loaded and leap almost to the top of the screen. They can digest metal, so if your ship gets in the way, they grab it, shake their heads several times, and swallow you whole.

Your ship lacks brakes and has a bit of inertia to it. Once you learn to control it, outwitting the Leepers still takes practice. Their leaps are predictable and, of course, you have guns activated by one or the other joystick buttons, depending on which direction you would like to shoot. Although you can learn to kill them easily, they happen to be worth more alive than dead. You get twenty points for killing one, but one thousand points for each one left alive after you've rescued all your men.

The strategy is to learn to outwit them. You can't just rescue a captive and fly high to avoid the Leepers, for they invariably manage to steal the guy you're carrying beneath your ship. You can't even take your time during the rescue, because when lunchtime comes a Leeper slowly creeps over and eats one of your friends, whom he regards as a gourmet morsel. Your rescue strategy must also consider refueling. You have to outfly those leaping Leepers and return to one of the two bases before you run out of fuel. The bases are on either side of the terrain; a radar gauge at the bottom of the screen tells you the distance from them. When you have rescued all the hostages, or killed all the Leepers, you advance to stage two.

Now your mission is to destroy the gigantic Queen Trabant at the end of a long tunnel beneath the planet's surface. Of course, an army of smaller Trabants, as well as strategically placed laser beams, guard the queen. It's actually an easy mission on the first level of difficulty if you don't run out of fuel before you dispatch the enemy. The Trabants don't shoot back until level two, and by then several Trabants escaped from the cave have filled the above ground rescue scenario. They now make your mission a real challenge. On upper levels, the little buggers even shoot back in the caves. The game allows you to choose your own starting level.

Lunar Leepers is a silly but thoroughly enjoyable game. The animation is cute and the slow paced action is a good meld of a straight rescue game and the typical shoot-'em-up scenario.

STELLAR SHUTTLE
Company: Broderbund Software
Language: Machine Language
Hardware Requirements: 16K

Department: Entertainment
Sugg. Retail: \$24.95
Availability: 8
Disk or Tape: Both

OVERALL RATING	C +	CONTROLLABILITY	C +	ERROR HANDLING	N/A
GAME CONCEPT	C +	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	C +	HOLDS INTEREST?	C +
GAME DEPTH	C -	GRAPHICS	C +	VALUE FOR MONEY	C

Stellar Shuttle resembles the arcade game *Lunar Rescue*. The object is to rescue six stranded space explorers on the planet's surface. Your shuttle craft is released from a mother ship that hovers patiently above as you descend to the surface through a deadly asteroid belt. The craft is joystick maneuverable, has thrusters for slowing the approach when maneuvering through the asteroids, and lasers that can be used to clear a path during the ascent. The ship must be landed at either of two bases, and your descent speed is not important since the ship can be landed without retrothrusting. What is important is that you make six round trips, rescuing three men from one base and three from the other. During the ascent, when the speed is constant, you must avoid or shoot comets, alien ships, and asteroids that block your path. Upper levels sport a dragon on the surface who devours your captives before they reach your ship. The instructions hint that you receive 200 points for killing the dragon, but so far it isn't clear how this is accomplished.

Stellar Shuttle is a nicely implemented game with good graphics and sound effects. It offers a fine challenge, but doesn't have much depth, becoming repetitious after extended play.

RESCUE AT 94K
Company: Business Data Center
Language: Machine
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: \$29.95
Availability: 4
Disk or Tape: Disk

OVERALL RATING	D +	CONTROLLABILITY	C +	ERROR HANDLING	N/A
GAME CONCEPT	D +	SKILL INVOLVED	D +	DOCUMENTATION	D +
CREATIVITY	D +	CHALLENGE	D	HOLDS INTEREST?	C
GAME DEPTH	D +	GRAPHICS	C	VALUE FOR MONEY	D

Rescue at 94K is a game in which you must rescue a number of compatriots buried on another planet. In a sense, it is a welcome reprieve to the numerous shoot-'em-up rescue scenarios that have proliferated on the market, but, unfortunately, *Rescue at 94K* lacks the tension the others instill and so interest quickly wanes. Its design is also weak. The first part barely holding together parts two and three.

In part one your job is to rescue the buried survivors. You have at your disposal a geiger counter and a limited supply of oxygen. As you move closer to the buried survivors the sound of the geiger counter emanating from the keyboard speaker clicks intensely. You must dig by pressing the trigger button about fourteen times before they are uncovered. There is a time limit of sorts, and little floating clouds sap two hundred units of oxygen each time you collide with one. While you can wait for the timer to run out, it is easier to reach part two if you deliberately collide with the deadly clouds and use up your oxygen. You may lose a man, but you save about three minutes of boredom.

The second screen is actually a way station between screen three and the stranded people. You must negotiate an open maze at the bottom past slowly floating poisonous clouds to the doorway at the top. Each time you bring back a survivor you must run the maze in reverse.

Only the third screen is visually interesting. There is a rapidly pulsing energy beam just outside a tight maze which prevents you from directly reaching the survivors. There are three consecutive numbers. The first and third are inside the maze, while the second is near the force field. Touching the numbers allows you to pass through the force field, and you must tread the maze and touch each of the three numbers in order. The only hitch is that the maze constantly changes each time you touch a wall, making the job slightly nervewracking but of little challenge. The rest of the game involves transporting the survivors back to your ship. You have to be quick and careful and complete the rescue before you run out of oxygen.

Rescue at 94K has some merit, and the kids will enjoy it. Unfortunately, it lacks real game depth or challenge.

PROTECTOR

Company: Synapse Software

Language: Machine

Hardware Requirements: 32K; disk drive or cassette player.

Department: Entertainment

Sugg. Retail: \$34.95

Availability: B

Disk or Tape: Both

OVERALL RATING	C	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B-	SKILL INVOLVED	C	DOCUMENTATION	C+
CREATIVITY	C	CHALLENGE	C	HOLDS INTEREST?	C
GAME DEPTH	C	GRAPHICS	A	VALUE FOR MONEY	C-

The arcade game *Protector* creates an unusual alien world of space cities, sputtering volcanoes, burning lava, falling meteors, dangerous laser bases, and UFO's. Set on a wide screen with a smoothly scrolling landscape, *Protector* is more a showpiece of Atari's graphics capabilities than a challenging game.

Playing the hero, your mission is to rescue the inhabitants of this luckless planet from the clutches of an alien ship that abducts them, dropping them into a nearby volcano. And since only 18 people remain alive when the game begins, time is not on your side.

The initial objective is to navigate past the city's laser defenses, and transport as many people as possible from the city on the left to temporary safety in the city on the right. Starting at your refueling base, you carefully navigate your ship past the city's defense posts. (On lower levels these installations can be bypassed.) As the screen scrolls, a multi-colored landscape of tunnels, mountains, and buildings stretches out before you. Sounds of trouble percolate in the background. Aliens hover around the frightened inhabitants who have gathered outside. The big alien mother ship maneuvers into position, engages its tractor beam, and kidnaps another victim. It's a almost hopeless situation as your laser fire bounces harmlessly off of the retreating ship.

Transporting these people to the city beyond the volcano can be accomplished by maneuvering your ship just above any man. He will signal that he can be lifted by dropping his hand. When your ship reaches the other city, pressing the fire button will drop the man. It is also possible to rescue people as they are dropped into the volcano — a rather tricky maneuver that must be timed just right, or you will be hit by the falling man. It is best to concentrate on transporting people, because a mistake costs you precious time by requiring you to start back at the refueling base minus one ship.

The volcano erupts once all inhabitants are evacuated from the first city. The alien ship doesn't give you any more trouble, but the creeping lava forces you once again to evacuate the people from the city on the right. These few must be transported across hostile territory where meteors fall and laser bases fire, to the safety of pneumatic tubes at the far right of the screen.

The game's graphics are superb and very detailed. They rely heavily on character set graphics, using a colorful, redefined character set. Your space ship and the alien ship use player missile graphics. From a programmer's point of view, the game uses almost every Atari graphics feature, and is a splendid example of machine language programming. The sound and music routines are dramatic and appropriate.

As a game, *Protector* has a rather weak scenario. This is not to say that the game isn't challenging, for at upper levels, when the game is speeded up, the time constraint is such that you are unlikely to save anyone without considerable practice. However, the game does begin to become tiring after several plays. It is a game that suffers from a dearth of immediate scoring goals, considerable repetition, and a general lack of excitement.



PROTECTOR



RESCUE AT 94K

PROTECTOR II

Company: Synapse

Language: Machine Language

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 6

Disk or Tape: Both

OVERALL RATING

B

GAME CONCEPT

B-

CREATIVITY

C

GAME DEPTH

C

CONTROLLABILITY

B

SKILL INVOLVED

C+

CHALLENGE

C+

GRAPHICS

B

ERROR HANDLING

N/A

DOCUMENTATION

C+

HOLOS INTEREST?

B-

VALUE FOR MONEY

C+

Protector II is an improved and more playable version of the author's original game. The object remains the same: to rescue the inhabitants of a city under alien attack, transport them beyond the volcano to safety in the city of New Hope, and later to the Verdann Fortress after the volcano erupts. However, the new version is much wider on screen; many of the terrain obstacles that previously made high speed flying risky have been removed. With the addition of enemy rocket bases capable of firing in all directions, alien chompers, and xytonic pulse-trackers that pursue your needelfighter across the sky, *Protector II* has become an arcade game with a mission.

There have likewise been a number of subtle changes that make flying easier. You need no longer worry about accidentally bumping into buildings when rescuing inhabitants of the cities. Collisions are ignored. Your ship gradually sinks to the ground when left in an unattended, hovering state, and you no longer drop a messenger when shooting at enemy craft with your laser. The game now features complete wrap-around. Gone are the banks of laser beams that guarded the entrance to the underground cities and the safety of the transport tubes. The Verdann Fortress, which can be reached in either direction, is protected from view by invisibility shields until Dragonmaw erupts. Only then does its armaments and the escape chute that they guard become visible.

The game is definitely more interesting to play now that it has more of a shoot-'em-up flavor to it. The first version had a rather unique look to it that has here been sacrificed for unobstructed maneuverability, allowing for faster play. The game is less difficult, but with added scoring possibilities. *Protector II* holds your interest longer.

CHOPPER RESCUE

Company: Microprose Software

Language: Assembly

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 4

Disk or Tape: Both

OVERALL RATING

B+

GAME CONCEPT

B

CREATIVITY

B-

GAME DEPTH

B+

CONTROLLABILITY

B+

SKILL INVOLVED

B

CHALLENGE

B

GRAPHICS

B+

ERROR HANDLING

N/A

DOCUMENTATION

C+

HOLOS INTEREST?

B

VALUE FOR MONEY

B

The object in *Chopper Rescue* is to rescue ten captives trapped in three different underground labyrinths. Your joystick-controlled rescue craft is a highly maneuverable helicopter. Each of the large scrolling labyrinths is guarded by patrolling drone defenders and numerous (but fixed) missile launchers powered by adjacent power plants. Your craft contains both bombs and missiles. Weapon choice depends on the position of the joystick; pushing straight down when firing drops bombs, while pushing either to the left or right launches a missile. Thus, two players can play as a team with one steering and the other acting as gunnery officer.

The labyrinth on level one is not a difficult one. There are several places where flying space is tight, but after the missile launcher guarding that area has been removed, flying in is no problem. The power plants appear to power the missile launchers, but damaging one doesn't appreciably slow down the rate of fire. There is a time limit to each level, and when your helicopter runs out of fuel it crashes.

The design of the second and third levels is markedly different from the first. The second level is much more open, while the third is overwhelmingly tight. You need to travel through a narrow, heavily defended tunnel at the start, and you'd better have all three of your helicopters left when you begin this assault.

Chopper Rescue is an attractive arcade-style game with good graphics and sound effects. Beginners can learn it quickly without becoming frustrated. The easily controlled helicopter offers relaxing play, yet the game can be a serious challenge for those who manage to reach the third screen or elect to play on the most difficult of the three levels. It should interest players for a moderate amount of time.



CHOPPER RESCUE



FORT APOCALYPSE

FORT APOCALYPSE

Company: Synapse Software

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 9

Disk or Tape: Both

OVERALL RATING	B-	CONTROLLABILITY	B-	ERROR HANDLING	N/A
GAME CONCEPT	B-	SKILL INVOLVED	B-	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	B	HOLDS INTEREST?	C
GAME DEPTH	C+	GRAPHICS	B	VALUE FOR MONEY	C+

An assault on a well defended underground fortress to rescue sixteen hostages is the object of *Fort Apocalypse*. The assault craft is a joystick-controlled helicopter; it can fire rockets when facing sideways, and drop plasma bombs when facing forward. Even the outside of the fort is well defended. Kralthan Tanks launch drone missiles to track your copter, and robot choppers patrol the sky. Fortunately, you can keep track of everything using your Navatron scanner at the top of the screen. This miniature, radar-like map scrolls with you as you fly around the fortress.

The entrance doors, although well guarded, can be blasted open. Once inside, your helicopter must be carefully flown down narrow guarded corridors. A light brush against a wall means instant death. The access doors to the laser and hyper chambers can be blasted open, but timing is crucial when penetrating the RFE shafts that have slowly moving energy blocks with gaps between them. Eventually the entrance to the fort's second level will be revealed. This level is similar to the first, demanding in addition that you penetrate the brick-like shield that supplies the fort's power. Then it's a quick escape to the surface where you fire one last rocket into the fort to blow it sky high.

Fort Apocalypse requires concentration. It is somewhat nerve-wracking to fly a helicopter under the influence of the pull of gravity down a narrow passage while under full attack. Skilled players enjoy the tension of battle; the less skilled sweat. The game is well implemented and has a responsive control system. The scrolling graphics use a redefined character set and are very good. Many players master the game with a fair percentage of wins after only an hour. Overall, the game is fun to play and should hold your interest for a moderate amount of time.

METEOR STORM

Company: Royal Software

Language: Machine

Hardware Requirements: 32K disk; 16K cassette

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 3

Disk or Tape: Both

OVERALL RATING	C	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C	DOCUMENTATION	C-
CREATIVITY	C-	CHALLENGE	C	HOLDS INTEREST?	C
GAME DEPTH	C-	GRAPHICS	C+	VALUE FOR MONEY	C

Meteor Storm is a rescue operation in which you must evacuate a city's ten survivors to an awaiting mother ship. Your small fighter must descend through the planet's debris-filled atmosphere to one of three landing fields within the city. The joystick-controlled fighter can maneuver side to side and retrothrust on descent, although final landing speed is not a factor. On ascent the ship can shoot forward as well as side to side. In addition, the ship has an "invisio" shield, good for three seconds total, that will allow it to pass through debris unharmed. It is probably more useful against the random meteor shower that bombards the city below.

Your landing time within the city must be minimal since the city's shield is down, making it vulnerable to a meteor impact. A direct hit can cost a thousand points, or the value of two rescued survivors on the first level. The game is easy at first, but becomes more difficult after the landing sites for the first three sites have been used. The debris field becomes denser, and the meteor shower is more frequent. When all ten survivors have been rescued, you move on to the next city.

It is a simple game (although not necessarily easy), and resembles *Lunar Rescue* in the arcades. The best part about the game is its music. The introduction has an outstanding multi-voice rendition of the theme from *Raiders of the Lost Ark*, and the music played softly throughout the rescue operation is from *Flash Gordon* (also the theme used in the arcade game *Vanguard*). *Meteor Storm's* graphics are colorful but average. As for the game itself, it lacks depth and quickly becomes boring and repetitious with extended play.

ASTRON IX

Company: Cosmi

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$5.95

Availability: 3

Disk or Tape: Tape

OVERALL RATING	B-	CONTROLLABILITY	C-	ERROR HANDLING	N/A
GAME CONCEPT	B-	SKILL INVOLVED	C+	DOCUMENTATION	B+
CREATIVITY	B-	CHALLENGE	B	HOLDS INTEREST?	C+
GAME DEPTH	B	GRAPHICS	C+	VALUE FOR MONEY	A

Astron IX sends you on a rescue mission in the caverns beneath the planet Astron IX. Using a joystick-controlled Magnaprobe, you must find and rescue nine humans captured during previous expeditions. Joystick control proves tricky. If you hold the button too long, the ship accelerates rapidly. Since the ship floats, you must maneuver it slowly and carefully through the narrow chambers to avoid colliding with the walls, which causes loss of shield strength. Your ship has limited shield strength, fuel, and weapon capability. To restock shield energy and weapons, you must gather them from random locations usually guarded by aliens. Although the aliens don't shoot at you (at least on the first level), they damage your shields if you collide with them. You must also be careful not to destroy what you want to recover and to compensate for the reverse motion caused by shooting your weapons. To get fuel, you dock at one of the supply depots scattered throughout the caverns. You also transport recovered fuel cells and rescued humans to the depot. Docking requires precise thrusting and steering; undocking requires holding the button down while moving the ship away from the depot. You transfer items by moving the cursor over the item and pressing the button, moving the item, and pressing the button again to release it. The whole procedure confuses beginners, but it becomes natural with practice. The cavern doesn't scroll, but changes scenes as the ship exits one chamber and enters the next. Each enemy encountered looks different and possesses strength as detailed in a chart in the manual.

Cosmi purchased *Astron IX* in a bankruptcy sale. Since the game requires complicated instructions and considerable practice, they decided to sell it cheaply. Unfortunately, the average consumer equates price with quality. *Astron IX* is a good rescue, shoot-'em-up game that requires more strategy than outright skill. It offers a definite challenge, and is worth far more than its price.

Scrolling Shoot 'Em-up Games

TAIL OF BETA LYRAE

Company: Datamost

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 6

Disk or Tape: Disk*

OVERALL RATING **B+**
GAME CONCEPT **B+**
CREATIVITY **B**
GAME DEPTH **B+**

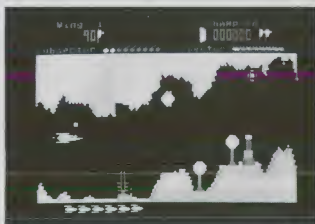
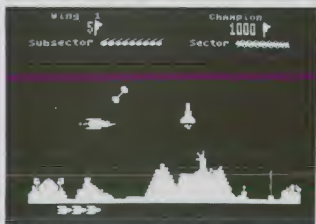
CONTROLLABILITY **B**
SKILL INVOLVED **B**
CHALLENGE **A**
GRAPHICS **A-**

ERROR HANDLING **N/A**
DOCUMENTATION **C**
HOLOS INTEREST? **B+**
VALUE FOR MONEY **B+**

Tail of Beta Lyrae, a horizontal scrolling shoot-'em-up game, follows the tradition of arcade games like *Scramble*. A nomadic race of aliens has taken over the mining settlements on the tail of the double star Beta Lyrae. Your mission: to destroy the alien surface installations and force their retreat from the inner planetoids.

Despite the familiarity of this classic scenario, the game possesses remarkable depth. It covers eight levels of nine sectors each, with terrain ranging from mountains to caverns, cities, and outer space. Your ship is joystick controlled and equipped with a particle beam weapon system. You can move up and down, backwards and forwards by accelerating and decelerating the rocket engines. You can destroy most of the ground installations with the particle beam, but such things as communications antennas need time to fall. Alien barricades resembling rotating floating barbells are indestructible. You must destroy ground lasers and plasma cannons, or sneak through gaps in the firing sequence. All of the hazards and alien installations are cleverly animated. The terrain is initially mountainous, but becomes cavernous on the second level and a cityscape on the third. The last level takes place in outer space, an area swarming with meteors. Although you cannot see all the levels without progressing through them one by one, a secret code word allows you to advance to the sixth level. You may not want to do this, however, because the game definitely gets harder near the end. You can increase the difficulty yourself by pressing a number from one to six at the start page.

The graphics are good and nicely animated. What I really found impressive was the eerie music, composed by Gay Gilbertson and played throughout the game. You can listen to the entire theme minus sound effects if you watch the mission briefing during the booting up period. The music deserves an award for originality, and the game equals the best of the scrolling shoot-'em-up games on the market. It has greath depth, is extremely playable, and offers a challenge even on the easiest level.



TAIL OF BETA LYRAE

AIRSTRIKE

Company: English Software Co.

Language: Machine Language

Hardware Requirements: 16K, cassette player

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 3

Disk or Tape: Tape

OVERALL RATING

GAME CONCEPT

CREATIVITY

GAME DEPTH

D

B-

C+

C

CONTROLLABILITY

SKILL INVOLVED

CHALLENGE

GRAPHICS

D

C

A-

B-

ERROR HANDLING

DOCUMENTATION

HOLDS INTEREST?

VALUE FOR MONEY

N/A

C

D

D-

Airstrike bears a strong resemblance to the horizontal scrolling game *Scramble*. The object is to pilot your joystick-controlled spaceship through the game's zigzag tunnel system, past an open space of deadly falling asteroids, then to an immovable "space wall" that must be penetrated in order to reach the next level. You have to contend with the falling meteors and anti-aircraft missiles launched from ground-based sites. You score points by attacking the missile launchpads and fuel dumps. Ammunition is replenished along the way through attacks on the enemy's ammo dumps. You use lasers or bombs during your raids. Lasers are fired with the joystick button, while bombs are dropped using the space bar, a more awkward arrangement.

The game, which boasts five levels of difficulty, is nearly impossible to play even on the easiest level. Much of the problem lies with a joystick control system that is too sensitive. The slightest touch moves the spaceship too far in the narrow tunnels. Another problem is that the ground-to-air missiles home in on your ship unless you develop the technique of accelerating or decelerating rapidly to fake them out. The missiles, which use character-set animation, move fast and crudely. And if you manage to get past them, the asteroids are likely to do you in because there is very little reaction time near the top of the screen. Worst of all, you start over each time you lose a ship. A battery of good players have yet to see the entire multi-screen tunnel system. The game is indeed very tough, perhaps beyond the level of frustration.

COMPUTER WAR

Company: Thorn EMI

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING

GAME CONCEPT

CREATIVITY

GAME DEPTH

C+

C

C-

C

CONTROLLABILITY

SKILL INVOLVED

CHALLENGE

GRAPHICS

B

C-

C

B

ERROR HANDLING

DOCUMENTATION

HOLDS INTEREST?

VALUE FOR MONEY

N/A

C

C+

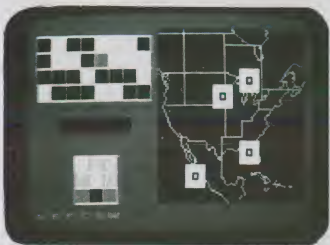
C

In *Computer War*, obviously based on the movie *War Games*, the computer at NORAD has detected a cluster of attacking missiles and has begun to prepare a counter-attack. You discover that the computer is actually playing a simulation, but to stop its real counter-attack, you must knock out the incoming missiles in the computer's memory bank and crack a code so that you can shut down the alerted missile bases.

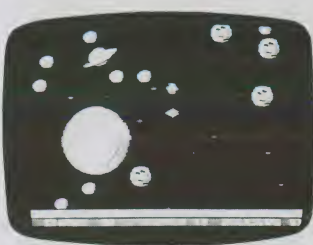
You begin with a large display of the North American continent showing NORAD and four missile bases. The system currently is in DEFCON 5, a state of peace. Suddenly, missile blips appear on the screen. You move your joystick-controlled cursor to cover one of the blips and engage it in mock combat by pressing the fire button. The view zooms into the combat area and you track the missile manually through landscape stored in the computer's memory bank. You have a limited amount of time to find and destroy the missile. A marker on one side of the screen indicates its direction, and a pulsing sound tells you when you are getting close. If you fail to shoot down the missile with your lasers, one of the bases goes on alert and the system drops one DEFCON stage. If too many missiles get past you, you may well find yourself on the way to nuclear war. If you do stop the missile, you return to the war and try to stop another. When you have destroyed all of them, you still face the problem of stopping the computer from launching a strike. To do so, match the pattern of steady lights among the blinking ones at the top of the screen. Once you match the pattern, move to the most vulnerable base on the map and deactivate it. The map restructures to begin anew with more bases to protect.

The graphics in this game are good, the display map detailed and realistic. I particularly liked the battle sequences in which the hunt for the missile begins slightly offshore and approaches land.

While the scenario is interesting, the game basically belongs to the arcade game. You find and shoot down an incoming missile that tries to elude you. If you are a good shot, you can temporarily stop the threat of war, but the game moves on to a harder level. It lacks tension and excitement, perhaps because it tries to teach you that a nuclear war cannot be won.



COMPUTER WAR



ASTRO CHASE

ASTRO CHASE

Company: First Star Software

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: B

Disk or Tape: Disk

OVERALL RATING	C	CONTROLLABILITY	C-	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C	DOCUMENTATION	C+
CREATIVITY	C-	CHALLENGE	B	HOLDS INTEREST?	C
GAME DEPTH	C-	GRAPHICS	B+	VALUE FOR MONEY	C-

Your mission in *Astro Chase* is to save the Earth from total destruction. The evil Megardians have placed sixteen Mega Mines in the close vicinity of your home planet. Each Mega Mine has the power to blow the planet to smithereens. As they slowly approach the planet, your joystick controlled fighter (which is constantly harassed by enemy fighters) must seek out and destroy each of the Megardians.

This shoot-'em-up game is played on a large scrolling galactic playfield which does not have a wraparound feature. The colorful background includes a large Earth, stars, and asteroids, and is superbly implemented with a custom character set. The ship is always centered, and is maneuvered by joystick using what is called "single thrust propulsion." Due to the absence of the wraparound feature, the ship is unable to move too far from the home planet, and the screen will flash when you reach the boundary.

The ship bounces off background objects unrealistically, reversing direction on impact. The control system is rather odd and awkward to use when hunting down mines. The "single thrust propulsion" allows you to shoot in any of eight directions while moving forward, but there is no way to stop the ship. When you release the fire button the ship always moves in the direction at which the joystick was last pointed. In a cluttered universe, your ship is always colliding and changing direction; and because you have to eliminate the mine on a flyby, a direct hit is not guaranteed. Aligning the ship with a diagonally moving mine isn't that easy either.

There isn't a lot of depth to this game. The sixteen mines approach the Earth fast or slow depending on the difficulty level. The fighters that harass your search attempts and thwart your efforts can either be eliminated by laser fire, or by collision if you touch one of the four shield stations near the Earth. Fuel is a problem in long games, but it can be replenished at fuel depots at the fringes of the galaxy. The strategy is simple: quickly eliminate any threatening fighters while carefully eradicating the approaching mines. Check both above and below the planet because you can't see far in any direction. Remember, while lower levels are manageable, the mines approach the planet much too fast on upper levels to give you even a sporting chance. Also be aware that you'll encounter more fighters with the ability to pass right through obstacles.

Astro Chase has perhaps the best animated introduction on the market. The graphics and music are exemplary. Even the seven intermissions are said to be good, but with 35 levels, I would assume you need to save the Earth maybe five times in order to see one. I haven't been so skilled. But the game itself has little variation in game play. Perhaps it is a disappointment because it has been ballyhooed by the manufacturer as one of the great arcade games of all time. Great graphics can help, but they won't make a game.

ZAXXON

Company: Datasoft

Language: Machine

Hardware Requirements: 32K (disk); 16K (cassette)

Department: Entertainment

Sugg. Retail: \$24.95

Availability: 10

Disk or Tape: Both

OVERALL RATING	B+/C	CONTROLLABILITY	A	ERROR HANDLING	N/A
GAME CONCEPT	B+	SKILL INVOLVED	B/B	DOCUMENTATION	C
CREATIVITY	B	CHALLENGE	B/B	HOLDS INTEREST?	B/C-
GAME DEPTH	C+/C-	GRAPHICS	B/C+	VALUE FOR MONEY	B/C-

When *Zaxxon* first appeared in the arcades in the spring of 1982 it caused a sensation. The colorful three-dimensional view of a fighter attacking a highly detailed, diagonally scrolling space fortress was a showpiece in computer graphics. The fighter, able to maneuver in three dimensions, could bank on turns and swoop down toward the target as it fired its forward cannons. Its shadow on the fortress below and an altitude gauge on the side helped the fighter judge clearances. The huge multi-screen fortress was protected by laser gun ports, rockets fired from underground missile silos, and force field barriers flew under or over. Targets were numerous, including radar dishes, fighters on the runways, gun ports, and fuel tanks worth extra fuel for your ship. And when you finally flew past the end of the fortress, an entire armada of fighters engaged your ship in battle with the intent to stop your ship from reaching a second fortress. Those who managed to negotiate and survive a more formidable defense eventually confronted the megalithic robot *Zaxxon* himself, who stood armed with heat seeking missiles. It took several accurate hits in his vulnerable gun port to win.

Atari arcade fans waited anxiously for months while Datasoft's inexperienced programmers struggled to translate the game. *Zaxxon* fans knew that smooth scrolling the space fortress would be a piece of cake. Their only concern was whether the game would be close enough to the arcade version to please them.

Datasoft has produced two versions of *Zaxxon*, a 16K cassette version and a 32K disk. While the disk version included most of the original game's design, the cassette version skimmed on several important features related to conserving memory. The cassette version obviously aimed at the several hundred thousand Atari 400 owners who would rather have a mediocre *Zaxxon* than none at all. This division is reflected in the grades above.

Both versions use a more simplified background on the space fortress. The brick walls and the force fields are in fine detail, but the large buildings, colorful runways, and the hexagonal grid have been replaced by solid blue. The radar, missile silos, planes, and gun emplacements are in detailed character graphics, while the rockets, enemy fighters and laser fire are in rough character graphics and lack smooth movement.

The spacecraft is well drawn, and joystick control is very smoothly implemented. The ship climbs, dives, and banks left and right just like a real airplane. Beginners need to either watch the altitude gauge on the right, or determine their height from a combination of shadow placement and laser strikes.

The outer space fight sequences vary widely between the two versions. The disk version allows full freedom of movement, while the cassette version only allows the spacecraft to move side to side. The character graphics planes in the cassette can only move forward, and are sitting ducks if you fire as they first enter the screen. Even beginners can get through this level. This phase ends when twenty ships have been destroyed. In the disk version, the enemy craft change altitude as they approach which gives the effect of side to side motion. Like your ship these crafts appear to become smaller as they drop in altitude. These sequences lack smoothness, but this doesn't detract from the game. In fact, this portion is a definite challenge in the disk version and requires some practice.

In both versions the second fortress is much more difficult than in the first. The cassette version lacks missile silos, but the real challenge is flying through the narrow gaps between the wall and the force field above. After six or seven of these sections your craft stops directly in front of *Zaxxon*. The disk version has a detailed robot who fires a heatseeking missile that slowly homes in on your craft: there is no escape. In order to survive you must shoot the missile down, preferably just as it's fired. A direct shot into the launch tube will destroy the robot. However, the cassette version's robot is sorely lacking in detail, fires missiles straight ahead, and you blow up even if you are off side. Since you obviously didn't suffer a hit, you wonder why you lost another of your three ships.

The disk on its own merit would be a fine game; the cassette version much less so. The disk version compares very favorably with Colecovision's cartridge—similar graphics but finer scrolling. Buyers want the arcade game and that takes more memory than many of their machines have. This version of *Zaxxon* is a compromise, and barely lives up to its reputation in the arcades. But it is a good game that is both playable and enjoyable at least on disk. The cassette version is a marginal game, still playable but too easy and not as much fun. Neither version is what I would call addictive, but the game will hold your interest until you master it.

DEFENDER

Company: Atari, Inc.

Language: Machine

Hardware Requirements: 16K cartridge

Department: Entertainment

Sugg. Retail: \$44.95

Availability: 10

Disk or Tape: Cartridge

OVERALL RATING	A	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	B+	DOCUMENTATION	A
CREATIVITY	A-	CHALLENGE	B+	HOLDS INTEREST?	A
GAME DEPTH	B	GRAPHICS	B	VALUE FOR MONEY	A

Defender is an outstanding rendition of the William's arcade game. It is an intense, fast action shoot-'em-up game in which your ship's mission is to defend the planet's last ten humanoids from alien kidnappers who will transform them into deadly alien mutants. The skies above the scrolling, mountainous terrain are besieged with a variety of alien craft. The scanner, a radar like display at the top of the screen, helps pinpoint their locations throughout the battle.

The alien fleet attacks in force as you maneuver your ship back and forth and up and down using joystick control. Lasers are the standard weapon, while three smart bombs capable of destroying everything on the main screen are also available. Unfortunately, these are activated by the space bar rather than by a second button which a single joystick lacks. You must hover over the keyboard to use it, but since this makes playing awkward, a friend will be of help to trigger the smart bombs when needed. Hyperspace control is also keyboard controlled.

The alien force is massive and persistent, yet you are able to manage it as it is spread over five to six screens. The landers are the first to appear. They kidnap aliens while defending themselves with white charges. Next, bombers lay mines that you must avoid, and then the attack force must be quickly dealt with before the Baiters appear. These ships fly faster than the *Defender* and home in on him with deadly white charges. The Pod is also dangerous, for it releases a group of Swarms when destroyed. These Swarms, or little red pellets of death, track you as you zoom in and out among the alien fleet. Destroy them quickly before you're trapped between them and the fleet.

Screams of help heard over the din of battle signal a kidnapping. The humanoid must be rescued before it is abducted to the top of the screen. If it is transformed into a mutant, it must be dealt with swiftly, for it will fly directly above or below you where you can't hit it, and then charge. Thus, rescue becomes the more logical approach. Careful aim will kill the alien, and allows you to catch the falling humanoid in mid-air and return it to Earth. There is a substantial bonus for this maneuver, but humanoids can survive short falls without your consummate skill. In addition, if you lose all your people the battle shifts to space, for the planet is lost. You have three ships and three smart bombs to start, and can earn extra weapons at various point levels.

Defender is one of the best action-packed shoot-'em-up arcade games on the market. It offers excitement that most of the competition lacks. It is a complex game with many nuances of play strategy that keeps the player thoroughly involved and willing to play for long periods of time. The graphics are stark but adequate. The scrolling and radar displays are exceptionally smooth and detailed, and all things considered, it is a game you won't tire of quickly.



ZAXXON



SKY BLAZER



RIVER RAID

SKY BLAZER

Company: Broderbund Software

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$31.95

Availability: B

Disk or Tape: Disk

OVERALL RATING

A

CONTROLLABILITY

A

ERROR HANDLING

N/A

GAME CONCEPT

B+

SKILL INVOLVED

A

DOCUMENTATION

B

CREATIVITY

B

CHALLENGE

A-

HOLOS INTEREST?

A-

GAME DEPTH

A

GRAPHICS

A

VALUE FOR MONEY

A

Sky Blazer is a five level scrolling arcade game wherein your mission is to destroy various ground targets on each level by low level aerial bombing. The mission takes place over arid oil field terrain replete with oil derricks and cactus. What sets this game apart and elevates it to star category is the game's fine detail and technique required to kill a target or simply to stay alive.

The fine detail in the game is outstanding. Bomb bay doors open when your plane descends to low level bombing, and bombs hitting trees or cactus either get snagged in the branches or bounce off the tops and spin end over end before plopping into the sand. A collision with a tall oil derrick shears off the structure and results in fragments of your plane arcing slowly to the ground. And while you are trying to maneuver under a spare fuel tank parachuted to you by a friendly supply ship, you watch the chute cords cut by enemy aircraft, and then, just barely missing the catch, you view the high octane fuel explode on impact with the ground. Then there is the sheer beauty of watching one of those ground-to-air, heat-seeking missiles fired by enemy tanks just miss the rear of your bomber as you perform a quick but subtle maneuver, and continue to watch in amazement as it arcs overhead, does a 180 degree turn, and attacks from the front while you desperately try to down it with your pulse cannon.

Developing a technique to deal with each of the targets in the five missions is the key to winning this game. Bombing the radar in mission one is relatively easy, except that the radar is often under a tree or the far side of an oil tower. This requires pulling up fast and lobbing the bomb in. You'll lose many planes perfecting this trick. Bombing the supersonic tank on level two has many solutions. Everyone who plays the game has a favorite strategy, because no matter how fast you fly or how far you lure the tanks toward you, the bombs miss their target. Some claim the cactus slows the tanks just enough to catch them, others try altering the bomb's trajectory through clever flying, and some kill tanks by luring them under a falling fuel tank. The third level requires care and patience either to shoot the aerial mines and slow transports or play cat-and-mouse with them while awaiting your ICBM target. The trouble is that they tend to keep you away from your target. Dealing with the missile and tank on level four isn't as bad; but avoiding two missiles fired nearly simultaneously on level five—no way.

Sky Blazer is played using a joystick. Control is quite sensitive, unlike that of the Apple version (from which this is a translation). Your ship zooms up, down, and forward much too rapidly if you hold the joystick in any one position long. The scrolling is not smooth, flickering as objects move from right to left. The game's playability, however, remains excellent, and it should hold your interest for quite a long time.

REPTON

Company: Sirius Software

Language: Assembly

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 9

Disk or Tape: Disk

OVERALL RATING	C	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C+	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	B-	HOLDS INTEREST?	C+
GAME DEPTH	B-	GRAPHICS	C	VALUE FOR MONEY	C

Repton is a scrolling arcade game that in many ways resembles *Defender*. Instead of protecting individual humans, your assignment here is to protect the entire city of Repton from Quarrior spaceships that are draining the city of power and stealing pieces of the city to build a base station. Your keyboard or joystick-controlled ship, which is armed with lasers, nuclear devices, and shields, is your planet's only defense.

The game has a very good feel in its play. It can be played in a relaxed, defensive posture, or as a hectic shoot-'em-up game with your ship on the offensive throughout. There are plenty of targets and considerable return fire, but the enemy is more concerned with depleting your city and quickly building a base than with harassing you. This doesn't mean that you are safe, for you can see them closing in on you if you watch the tactical radar at the top of the screen. While it is beyond hope to expect to last more than a few levels even with extensive use of shields, it is important to stop Quarrior raids on the city's energy supply. When warning lights flash, you must rush to break the Drayne ship's beam.

In these type of games, victory is usually slight at best. While it is possible to stay on level one for an extended period of time and shoot at waves of missiles launched from the Quarriors' hastily built base, sooner or later deadly single ships will precede an armada intent on wiping you out. Sometimes it is safer to kill the last enemy ships and advance to the next level, although the war might best be won by losing *Repton*.

When the city is destroyed, the battle shifts to the caves beneath the city. The object here is to destroy the Quarrior nerve center. You can no longer freely fly left and right, but proceed along a narrow tunnel against impossible odds. The ship can move up and down, but the left and right joystick movement only changes your position within the scrolling field by slightly speeding up or slowing down your ship. Clouds of ships attack, and dense packs of missiles endanger your advance.

The game's smooth graphics are very good; the detailed radar display is helpful throughout the game. While the game is not as fast and exciting as the real *Defender*, there is always plenty of action, and objects maneuver about the screen. *Repton* certainly offers a more relaxed and playable game with a choice of tactics.

RIVER RAID

Company: Activision

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 6

Disk or Tape: Cartridge

OVERALL RATING	B	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C+	CHALLENGE	B	HOLDS INTEREST?	B
GAME DEPTH	B-	GRAPHICS	B	VALUE FOR MONEY	B

Activision did a credible job in translating *River Raid* to computers. In many ways they improved the game, especially the graphics. In the game you fly a joystick-controlled jet fighter down a narrow river, destroying as many targets blocking your path as possible and avoiding the rest. The river is cluttered with ships, jet fighters, helicopters, bridges, and fuel depots. You can destroy the depots for points or use them to refuel your plane as you fly deeper into enemy territory. Each bridge marks a level of difficulty. On the harder levels the river narrows and the firepower opposing you increases. You must stay over the river because, strangely enough, your plane can only fly over water. Moving the joystick from side to side causes the plane to bank in either direction, while pushing it forward or pulling it back changes the plane's speed.

Two people can alternate playing the game, beginning on the level of their choice. The game is fun to play and even moderately addictive.

SURVIVOR

Company: Synapse Software

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 9

Disk or Tape: Disk

OVERALL RATING	C	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	C+	SKILL INVOLVED	C-	DOCUMENTATION	C
CREATIVITY	C-	CHALLENGE	C	HOLDS INTEREST?	D+
GAME DEPTH	C	GRAPHICS	C	VALUE FOR MONEY	D+

The object in *Survivor* is to destroy all four space forts on the screen by eliminating the gun emplacements within the fort. During the daring attack, your Starwedge Cruiser is constantly harassed by enemy trackers and kamikaze fighters, while outside the forts are swarms of fast moving asteroids which you must avoid.

The game can be played by one player, but it is best played by two or more players acting as crew. Two-player participation is the most fun with the player using joystick #1 acting as pilot, and the second player using joystick #2 acting as gunner. A third player operates an extra gun while the fourth serves as propulsion engineer. As the ship is maneuvered about the screen, the large space battlefield scrolls. The ship is not confined to the center, thus giving some illusion of free floating as it gradually accelerates and decelerates. Once it moves slightly off center, it immediately scrolls the screen.

The attack on a fort is only a matter of persistent and carefully timed shooting in tight spaces. Some of the gun emplacements are difficult to reach in the single-player game because the ship's guns only fire fore and aft. For instance, one gun emplacement in particular can only be reached through a narrow tunnel. The ship in the two-player game has more of a fighting chance. There, the gunner can fire in eight directions while his partner navigates.

While *Survivor* is a basic shoot-'em-up, a bit repetitive, and not particularly difficult on the easier levels, it is a playable game especially for two players acting as partners. In fact, it is one of the few enjoyable participation games. You will seldom get frustrated over your partner's mistakes, perhaps because you will almost always do worse when playing alone. The game's graphics are plain but contain some character set animation. The sound is minimal except for a bit of leaden Wagnerian fluff during the title screen. In brief, *Survivor* offers a fair game—nothing great, but nonetheless enjoyable for two friends.

ZEPPELIN

Company: Synapse Software

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 7

Disk or Tape: Both

OVERALL RATING	B+	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	B	DOCUMENTATION	C
CREATIVITY	B-	CHALLENGE	B+	HOLDS INTEREST?	B
GAME DEPTH	B+	GRAPHICS	B	VALUE FOR MONEY	B

As pilot of a zeppelin, you explore a 250-room cavern, your mission to dynamite enemy lairs on seven levels despite the heavy defense offered by enemy zeppelins, laser gates, balloons, falling rocks, and hamburger creatures. Moreover, your joystick-controlled craft responds to the vagaries of the wind. If you crash into a wall, you lose your craft. All passageways go somewhere, but some are more interesting than others. If you find a key, you can open doors to new areas of the cavern, though the key located at the entrance to the first level provides more hindrance than help because both you and it must fit through the passageways and barriers—and you can't use it on the first level, anyway. Switches scattered around the cavern offer further aid; shooting at them turns parts of the enemy's defense system on or off. Each switch has a specific function, unchanged throughout the game, whether turning off the balloons or starting earthquakes.

The game demands almost constant shooting. Your zeppelin can shoot in four directions, blasting through barriers, throwing switches, destroying objects, or clearing your path. If the ship touches anything, you lose one of your five lives. You gain a life by touching a life symbol or accumulating 10,000 points.

Zeppelin has colorful and animated graphics. The game offers plenty of action and strategy, and two people can play together, one acting as pilot and the other as gunner.

CAVERNS OF MARS

Company: Atari

Language: Machine

Hardware Requirements: 16K Disk

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 10

Disk or Tape: Disk

OVERALL RATING **B+**
GAME CONCEPT **B**
CREATIVITY **C+**
GAME DEPTH **A**

CONTROLLABILITY **B+**
SKILL INVOLVED **B**
CHALLENGE **A-**
GRAPHICS **B**

ERROR HANDLING **N/A**
DOCUMENTATION **B+**
HOLDS INTEREST? **A**
VALUE FOR MONEY **B-**

Caverns of Mars is a fast-paced and addictive arcade-type game for the Atari computer with a disk drive. The object is to destroy a Martian base located in a deep and winding cavern beneath the surface of Mars. The game, which features extensive and smooth vertical scrolling, requires you to navigate your ship through five levels to an arming device at the very bottom of the screen. You then have to escape by navigating back through the maze before the timer runs out.

You are given five ships to accomplish this difficult task. Your ship is joystick maneuverable (back and forth as well as up and down). The up and down movement runs at twice the speed of the cavern walls scrolling past, and this flexibility is useful for making long passes during which your ship needs to remain in a stationary position for short intervals relative to the walls. You must realize that once your ship reaches the top of the screen, it again moves at a constant rate downward through the cavern. Learning to take advantage of this principle is what makes this game interesting, as well as frustrating.

Level one is simply a series of winding passageways cluttered with alien ships and fuel. Since your ship is always expending fuel, collecting these various five-unit fuel bonuses by firing your dual guns is important. Without these, your ship will eventually run out of fuel and explode. The game becomes much harder in level two, where screenfuls of alien ships attempt to destroy you by colliding with your vessel. Fortunately, they don't return fire, or you might never see level three.

The third level contains numerous moving force-field barriers — as many as three deep. This is where the ability to remain stationary for short periods relative to the downward scrolling caverns comes in handy. These fields activate, and then move upwards at predictable intervals. Your ship must move into the gaps, remaining stationary at the correct intervals. Unfortunately, the next level isn't nearly as predictable. The passageways are filled with flickering blue diamonds. The slightest contact with them is lethal.

Level five contains many narrow vertical and horizontal passageways. You will have to drop to the bottom of the screen to allow sufficient time to make the long horizontal traverses without striking the tops of the passageways. Fuel tanks also block many of the vertical passageways. If you make it past this point, you will reach a long, verticle passageway where you'll find the arming device. Once the timer is set, you have only the same amount of seconds to navigate all the way back through those winding tunnels before the base explodes. You can't afford to lose even one ship, or you won't make it in time.

Caverns of Mars can be played at various difficulty levels. The "novice level" only contains the first two levels, while the "commander level" has all five steps. If you lose a ship, you begin again in the tunnel at the level that your ship was destroyed. For those who need practice on upper levels of the game and don't want to start from scratch, press the TAB, CTRL, and SHIFT keys simultaneously. You must hold these down after the game starts until it shifts to each new level. This point is undocumented.

This game is great fun. It makes extensive use of the Atari's capabilities in smooth vertical scrolling, and a re-defined character set. It is a must for any dedicated arcade game player.



ZEPELIN



PHOBOS

PHOBOS

Company: APX/Atari Program Exchange

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 9

Disk or Tape: Disk

OVERALL RATING	B	CONTROLLABILITY	A	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	B	DOCUMENTATION	B-
CREATIVITY	C	CHALLENGE	B	HOLOS INTEREST?	B+
GAME DEPTH	A	GRAPHICS	B	VALUE FOR MONEY	B

Phobos is the author's sequel to the highly successful *Caverns of Mars*. In this game you have to cut through sixteen levels of defense to reach the enemy command at the center of Mars's largest moon. At first your joystick controlled craft plummets through caverns while picking up fuel and knocking out the enemies' defense missiles with your twin lasers. These lasers fire alternately. This works fine when you approach targets that are set left, right, left; but if you miss, your guns are out of sync in the narrow corridors, and you risk collision with the target. If you lose a ship, you start again at the beginning of the last level. By the time you have reached the fifth level, gravity inside the small moon becomes so negligible that you gain full control of the speed of your descent, and fortunately so since the moving force fields need careful timing to pass through their gaps.

Fuel is always a problem. You can't dawdle through any of the sequences, and you must pick up as much fuel as possible by knocking out the fuel tank targets. This is especially true in the levels with barriers that must be blasted out in order to pass through.

While there are no long traverses in this game, nor is there much variety, *Phobos* has enough challenges to make it interesting. The graphics are good and similar to the graphics in *Caverns*, but whether it is a better game than the original is debatable. The game can be played at a variety of difficulty levels, and for those who need practice on upper levels of the game and don't want to start from scratch, press TAB, CTRL-M and SHIFT keys simultaneously. You must hold these down after the game starts until it shifts to each new level (this point is undocumented).

This entertaining game makes extensive use of the Atari's capabilities in smooth scrolling and redefined character set. It is a good choice for the dedicated arcade game player.

AIR-RAID

Company: APX/Atari Program Exchange

Language: Machine

Hardware Requirements: 24K (disk); 16K (cassette)

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Both

OVERALL RATING	D	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C-	CHALLENGE	C+	HOLOS INTEREST?	D
GAME DEPTH	D	GRAPHICS	D+	VALUE FOR MONEY	D

Air-Raid is a slow-paced scrolling arcade game in which the object is to defend your two airfields and radar complex from a fleet of enemy bombers. Your joystick controlled fighter is equipped with short-range guns, and carries a limited fuel supply which can be replenished at either of the two airfields, assuming they're still operational after a raid. Your fighter's performance with full fuel tanks leaves something to be desired, but fortunately, added performance can be achieved by jettisoning one of the fuel tanks. A faster plane is definitely needed to out-fly any accompanying fighter escorts later in the game.

Picking off bombers is a piece of cake at the beginning. They are sitting ducks as they fly undefended in set formation, never attempting to evade your plane. You know their exact position from the radar display at the top of the screen. Subsequent raids use larger fleets and some forward return fire, but they can be easily picked off from the rear. When enemy fighters join the fray and the bombers become smart enough to cover their vulnerable zone, the game becomes more challenging. Fortunately, you don't have to start on the boring levels, for you can skip as many as you like at the start.

Air-Raid is simply not a very good game. The character graphics are plain and unanimated. Worst of all, it lacks excitement. Had it required more strategy to defeat the enemy, it would have been a more enjoyable game. This is not to suggest that the game is easy to beat on the hardest levels where three fighters guard sixteen or more bombers, but winning just isn't much fun.

SEA DRAGON

Company: Adventure International

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING **B+**
GAME CONCEPT **B**
CREATIVITY **B-**
GAME DEPTH **B+**

CONTROLLABILITY **B**
SKILL INVOLVED **B**
CHALLENGE **A**
GRAPHICS **B**

ERROR HANDLING **N/A**
DOCUMENTATION **B-**
HOLDS INTEREST **B+**
VALUE FOR MONEY **B**

Sea Dragon is a scrolling underwater arcade game. In it, you must guide your submarine past deadly mine fields, through narrow underwater tunnels guarded by laser gun turrets, and along stretches of depth-charged waters to your final target, the Master Mine. This Master Mine must be destroyed, because it controls the entire impenetrable mine field effectively cutting off your fleet's supply lines.

Your nuclear submarine, "Sea Dragon," is completely maneuverable by joystick. It can only remain submerged for a limited time, because its life support systems have a restricted supply of air. It can only fire torpedoes straight ahead, and therefore must avoid the Laser Bases that fire straight down in the tunnels, the Supershooters which fire at an angle, and the Destroyers which drop depth charges. The strategy is to outmaneuver them. You will also have to learn to pace your submarine past the firing patterns of the Supershooters, and learn to "drop back" in order to avoid collision to the rising mines and falling depth charges. There are other obstacles, such as the Stalactites and Force Fields near the end of your voyage; but these are sections that none of our play testers have ever reached.

The game has considerable depth. There are six separate segments of the game spread over 30 screens. Each portion is increasingly difficult. Each time one of your five subs has been hit you will be returned to the beginning of the section you are in. None of our play testers managed to get through the first three sections of the game on the easy levels; and those arcade players who find these kind of games "a piece of cake" will have to contend with three harder skill levels. We tried the hardest level. Mines don't just float up towards you, they're shot toward your sub, and there is no time to move out of the way.

Sea Dragon is nicely animated using player-missile graphics and a smoothly scrolling character graphics playfield. The game, while not fast-paced, is engrossing and quite a bit of fun to play. The game has depth and is very challenging.

Hint: if you would like to practice the advanced sections, wait for the title page to appear, then use the joystick button in port 4 to change start. You will hear a click and a number will change at the top left. Similarly, joystick #3 will give you 10 subs.

NIGHT RAIDERS

Company: Datamost

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING **D**
GAME CONCEPT **C+**
CREATIVITY **D+**
GAME DEPTH **D**

CONTROLLABILITY **D**
SKILL INVOLVED **C**
CHALLENGE **C+**
GRAPHICS **C**

ERROR HANDLING **N/A**
DOCUMENTATION **D+**
HOLDS INTEREST? **D**
VALUE FOR MONEY **D**

A mediocre shoot-'em-up game, *Night Raiders* begins over a vertically scrolling city defended only by tanks. You move past fuel dumps and a railway bridge to the area where airplanes attack. Your mission: to destroy as much of the enemy's military power as possible. Your ship moves back and forth along the bottom of the screen, firing guns or laser cannon. Moving the joystick forward or backwards changes the point of fire, but so slowly that it limits the challenge of the game. If you can't take aim and destroy enemy ships quickly, they'll succeed in shooting you down.

I found the game dull, with very little to hold my interest. Wrecking the bridge stops a train, and shooting the fuel depot gains you extra fuel, but these features occur in better games. The attractive scrolling background does nothing to enhance the playability of the game.



TRION



BLUE MAX

TRION

Company: London Software

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 3

Disk or Tape: Disk

OVERALL RATING

D

CONTROLLABILITY

C

ERROR HANDLING

N/A

GAME CONCEPT

C-

SKILL INVOLVED

C-

DOCUMENTATION

C

CREATIVITY

D+

CHALLENGE

C

HOLDS INTEREST?

D

GAME DEPTH

C-

GRAPHICS

D+

VALUE FOR MONEY

D

Trion is a shoot-'em-up game that the advertisements have ballyhooed for its three different 3-D screens. If you have high expectations of outstanding graphics, be prepared for a bitter disappointment. The player commands a scout ship to explore the surface of a newly discovered planet. The view from above presents a scrolling mural depicting deep canyon walls. The orange colored walls pulsate with annoying persistence. Some walls are bridged, and when it appears you can fly beneath a bridge you usually can. Normally a collision with any wall uses up valuable fuel to power your shields. Areas that you can tunnel through lack a black border (which the program obviously uses to detect collisions). The object in this valley is to destroy ten Silurian ships. Extra fuel and ammo are also available if you shoot at any area marked with the appropriate lettered box. When you have reached 1,000 points or ten ships, you advance to the next screen.

The object here is to blow up Silurian force bombs for points. The second screen is a tunnel that creates an effect of depth by moving the colors on screen outward near the exit or perimeter. It takes two hits to destroy each bomb. You can obtain additional fuel and ammo by shooting down Silurian ships that fly toward you. Score another thousand points and you reach the Barrier.

This final screen is similar to the first with the exception that you can shoot out pieces. The object here is to quickly destroy ten maintenance ships before you collide with the Barrier. While it may be possible to blast a corridor open, it is best to get your thousand points by killing ships. If you succeed, you will reach the tunnel again. This time it will take two hits to destroy each Silurian drone ship.

Trion is a disappointing game. The graphics are not that bad, except that the changing luminance is very annoying. The graphics are certainly not what I pictured as three-dimensional. The game itself is a simple shoot-'em-up contest in which it is more important to avoid the walls than to worry about enemy threats. Your targets are virtually sitting ducks. While a game with three screens is expected to have some play depth, this one is too boring for the number of screens to matter.

BLUE MAX

Company: Synapse Software

Language: Machine

Hardware Requirements: 16K cassette, 32K disk

Department: Entertainment

Sugg. Retail: \$34.95

Availability: B

Disk or Tape: Both

OVERALL RATING	A	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B+	SKILL INVOLVED	B	DOCUMENTATION	B
CREATIVITY	B+	CHALLENGE	A	HOLDS INTEREST?	A-
GAME DEPTH	B+	GRAPHICS	A	VALUE FOR MONEY	A-

Blue Max is a three-dimensional, diagonally scrolling, aerial combat game. The mission in this three-stage game is to destroy as much of the enemy's air force in aerial dogfights as possible while simultaneously blasting the enemy ground targets by bomb drops or low level strafing runs. Eventually, you will reach the city where you must bomb three specific ground targets to win.

Your aircraft is controlled by a joystick. For some strange reason the author has installed the controls backwards, but if you select reverse controls the game works well. That is, pull back on the stick to make the plane climb, and push forward on the stick to make the plane dive. The machine gun is activated with the trigger, and bombs are released by pushing the button while lowering altitude. An instrument panel displays airspeed, fuel, altitude, and the status of your plane's equipment. A letter flashes when a part is damaged. Likewise, a flashing asterisk indicates whether an enemy plane is above or below your craft, or approaching from forward or aft.

The plane takes off from a small landing field. It must reach 100 mph before lift-off or it will crash. Once in the air, your plane begins flying over enemy terrain which includes heavily fortified river anti-aircraft guns, some on moving barges. Your plane casts a shadow over the scrolling terrain below, giving a good visual indication of the plane's altitude and providing a useful bombsight. Wind plays a factor in this game, and falling bombs tend to drift. Some of the targets are marked with an X and offer more points. The plane's machine guns can be used to strafe at altitudes between twenty-one and twenty-five feet.

When you have scored 1,000 points the terrain begins to scroll over a roadway and the enemy's airfield. You can bomb their hangar and several planes parked beside the runway. Afterwards, the terrain begins to scroll back to the river. Only after you have achieved a score of 5,000 points does the terrain scroll over to the enemy's city. The objective here is to bomb three specially marked targets in the center of the city; you must fly down between the tall buildings to reach them.

The most thrilling part of *Blue Max* is the aerial dogfights. Planes approach either from the front or rear. You attempt to fly at the same altitude and line up your guns. Tackling a plane head-on is outright dangerous since you are more likely to collide with it than shoot it down. Planes coming up from the rear are easier to hit if you wait until they pass before blasting them with your machine gun. As your aircraft flies through heavy anti-aircraft flak, damage is likely to occur. Letter indicators advise you of damage sustained such as decreased maneuverability, leaking fuel, or damage to bomb gear or machine guns. When all four letters are lit the plane will crash.

The plane can be refueled and repaired at your airport. The computer alerts you when you approach an airport. Put down the landing gear, fly low, and land as close to the main building as possible. If you land too far up the runway, you will never manage to reach liftoff speed before reaching the end of the runway. You are also a sitting duck on the runway as enemy planes fly by overhead.

Blue Max is a very enjoyable game that gives you a realistic sensation of flying a bi-plane over three-dimensional, diagonally scrolling terrain. A challenging game, it takes some practice to avoid frustration. You only have one plane, so once you crash you have to start over. This game has great depth of play to hold interest for a long time.

Shoot-'Em-Up Arcade Games

STAR RAIDERS

Company: Atari
Language: Machine
Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$44.95

Availability: 10

Disk or Tape: Cartridge

OVERALL RATING	A	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	A-	SKILL INVOLVED	B+	DOCUMENTATION	A
CREATIVITY	B	CHALLENGE	A	HOLDS INTEREST?	A-
GAME DEPTH	B	GRAPHICS	B+	VALUE FOR MONEY	A

Star Raiders is a high speed space battle game against the Zylons for control of the galaxy. It's so realistic that you actually feel as if you're traveling through space. The superb interplay of sound effects with fast visual action using player missile graphics, and a game design that is simple yet challenging, have made this game a classic.

Star Raiders puts you at the controls of "Star Cruiser 7." The mission is to rid the galaxy of Zylons. Your sub-space radio links you with starbase command, and gives the present whereabouts of all enemy ships. Your short and long range sensors, together with an attack computer, keep track of the enemy's position within your galactic quadrant.

The Atari joystick acts like the control stick of an airplane. Pushing the stick forward and pulling back causes the ship to dive and climb, respectively. Moving left and right are true directions, although somewhat confusing if the view is aft. Energy torpedoes are fired with the joystick button. All other commands including activating shields, long range sensors, setting cruise speed, and activating the hyperwarp drive, are by single keyboard commands.

Initially the Zylons are scattered throughout the galaxy. Their strategy is to surround and destroy each of your star bases. Your goal is to attack and destroy as many enemy ships as possible, using the least energy in the shortest period of time. Your final score is loosely based on this criteria.

The battle begins by hyperwarping into a quadrant of enemy ships. The attack computer at the lower left of your three-dimensional, moving star field shows the relative direction of the nearest enemy ship. Within seconds of encountering either an enemy ship or a star base, you must blast it to smithereens with your photons or risk heavy damage with its return fire. The enemy doesn't stand still, but zips back and forth firing energy bursts at you. Even with considerable skill, you are lucky if you can keep the enemy in your cross hair long enough to intercept his return fire, let alone annihilate him. Taking a direct hit, especially on more advanced levels of play, usually results in severe damage needing repair at the nearest starbase. A crucial hit on your shields while engaging a Zylon basestar can result in a dramatic end before your ship can escape at hyperwarp speed.

The game offers four skill levels. At the novice level your ship is virtually invincible. It is a training level that requires no steering when hyperwarping. Advanced levels of *Pilot*, *Warrior*, and *Commander*, by comparison, require holding the precise course during hyperwarp. Upper levels need considerable skill to last more than a few minutes against a determined enemy. The Commander level will test the mettle of the best arcade players.

The game is simply great. Those who are fortunate enough to play it on a large screen projection TV will find it "awesome." Despite the debut of newer arcade games over the past two years, and numerous attempts to surpass the 8K game's visual effects, *Star Raiders* remains the classic.



STAR RAIDERS

ASTEROIDS

Company: Atari

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 10

Disk or Tape: Cartridge

OVERALL RATING B-
GAME CONCEPT B+
CREATIVITY B
GAME DEPTH C

CONTROLLABILITY B
SKILL INVOLVED C
CHALLENGE C
GRAPHICS C+

ERROR HANDLING N/A
DOCUMENTATION B-
HOLDS INTEREST? B-
VALUE FOR MONEY C+

Asteroids is a fascinating game in which you must navigate a spaceship through a field of moving asteroids. The object is to score points by shooting these asteroids apart. Of course, pieces of asteroids make the game more perilous; in addition, an alien spacecraft randomly enters the field and attempts to destroy your ship.

Yet this 8K ROM version is in many ways a disappointment, especially when compared to the superior arcade version designed by Atari's coin-op division. The graphics have a chunky look, no doubt a result of the graphics mode having been implemented in #7 (BASIC), rather than a finer resolution, four color mode like Antic #15. The asteroids appear as irregular blue masses against a black background.

The game can be played by one to four players. There are a number of play options, including hyperspace, shields, and flip-over. The latter allows your ship to flip directions 180 degrees by pulling towards you with the joystick. This is very helpful when confronted by asteroids approaching simultaneously from front and back, for normally you would have to slowly turn your ship around by moving the joystick to the left or right. The shield option, on the other hand, is ridiculous. When the shields are on, your ship appears as a round blob, completely unaffected by colliding asteroids. Since there is no time limit for shield use, you can keep the shields on until all danger is past. The skill level drops to near zero when using this option.

When more than one person is playing, there is a choice of playing in patrol or combat modes. Team play is even possible with three or four players. Shots made during the patrol mode pass right through other ships, while they can strike an opponent in the combat mode. Players playing in the two player mode have a choice of playing by turns, or they can rack up points competitively while on the screen at the same time. In three and four player games, players always appear simultaneously.

Asteroids should have been a much better game than it is, and certainly closer to the coin-op version. The enemy saucer is not much of a shot — only a nuisance in this version. However, the game is quite engaging to play with three or four players.

K-RAZY SHOOT OUT

Company: CBS Electronics

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING B-
GAME CONCEPT B
CREATIVITY B-
GAME DEPTH C+

CONTROLLABILITY B
SKILL INVOLVED B
CHALLENGE B
GRAPHICS B-

ERROR HANDLING N/A
DOCUMENTATION C
HOLDS INTEREST? C+
VALUE FOR MONEY C

K-Razy Shootout is a very good rendition of the arcade game *Berzerk*. You enter a building in which the rooms are guarded by robot sentries. The object is to score points by killing all of the robot guards in a room within a given time limit, then advance to the next room through the left door. Although there appear to be few adversaries on the screen at any one time, killing a robot results in another appearing near the room's edge. Since a collision with either a wall or a robot results in the loss of your man, the best strategy is to stay away from areas where they randomly appear. All of the robots must be killed before exiting, or you must repeat the same room over again with a new set of robots.

Scoring depends on the robot's manner of demise. Some are killed by your fire, others by collision with one another, and a few by shooting themselves. Other scoring factors include the amount of ammunition used and the time left. A bonus man is awarded at 10,000 points, and you'll need these extra men since the robots are much more lethal on upper levels. They begin shooting back in room two, and become outright deadly by room four. A better strategy at this point is to lure the robots into a crossfire or collision course.

The game's sound and graphics are exceptionally good. Arcade purists will despair at the lack of the bouncing ball, and a count of how many droids they have left to kill; but they will find this version just as challenging as the arcade version. The game does have a "wierd" ranking system that can cause needless frustrations, but overall, *K-Razy Shootout* will make for an enjoyable pastime.

DELUXE INVADERS

Company: Roklan

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$34.95 disk / \$39.95 cartridge

Availability: B

Disk or Tape: Disk & Cartridge

OVERALL RATING	C +	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C +	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C +	CHALLENGE	C +	HOLDS INTEREST?	C
GAME DEPTH	C -	GRAPHICS	C	VALUE FOR MONEY	C -

Deluxe Invaders is an improved version of the original *Space Invaders* game. It is a game in which you must shoot down an advancing horde of alien creatures who are continuously shooting back. They march across the screen in orderly ranks, and drop down one level when they reach the edge. You must defeat them before they land on your mobile gun turret base (which can be moved behind four castles for temporary protection). The turrets, however, are temporary shelters because the aliens soon destroy them.

This version can be played by either one or two players alternating turns. On advanced levels, the invaders split in two if they aren't shot exactly on center. This makes the game more difficult, since there is a limited amount of time to destroy the aliens before they land.

Deluxe Invaders is very faithful to both arcade versions of *Space Invaders*. The graphics and sound effects are well presented. Although it is an older game, it still catches on and has a very faithful following.

CENTIPEDE

Company: Atari

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$44.95

Availability: 10

Disk or Tape: Cartridge

OVERALL RATING	B	CONTROLLABILITY	C -	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C +	DOCUMENTATION	C +
CREATIVITY	C	CHALLENGE	B	HOLDS INTEREST?	B
GAME DEPTH	B -	GRAPHICS	B -	VALUE FOR MONEY	B +

Centipede takes you into the deadly world of garden bugs where an endless stream of jumping spiders, poisonous scorpions, frenzied fleas, and slithering centipedes thread a mushroom garden. They're out to get your dreaded bug blaster in this fast action, shoot-'em-up arcade game. The object is to stay alive, kill as many bugs as possible, and score high.

Staying alive sounds simple, but every time a bug is killed it turns into a mushroom that clutters the playfield. These can be removed by shooting twice at each mushroom; however, a frenzied flea, which drops toward the bottom of the screen like a kamikaze pilot, has a magical power to create mushrooms wherever it lands. The centipede snakes back and forth through the garden until it bumps into a mushroom. When this happens, it reverses direction and drops down one row. You must destroy every segment of the Centipede before it can reach the bottom of the screen, otherwise the segments can break up into many new Centipedes. Centipedes, like worms, will split in two when cut in the middle, each part with a head taking a separate path. With the addition of a scorpion that poisons mushrooms in its path, and centipedes that become insane on contact and charge your bug blaster, the game can become a real challenger.

Played with a joystick on a horizontal screen rather than on a vertical screen with a trackball, *Centipede* is not as difficult as the original arcade game. Beginners might find this hard to believe since fast, precise positioning is difficult to achieve with a joystick. Also, the horizontal screen gives you slightly less reaction time. However, some have managed to turn the score over 1,000,000 points with practice. This is possible because you receive a bonus blaster every 10,000 points, and can accumulate up to six reserve blasters.

The game is similar to the arcade version; the graphics and sound effects are close. Joystick control is irksome, as you often need to tap the controller to accurately position the blaster beneath a mushroom. (The new trackball controllers perform this effortlessly.) The game is fun to play, and, surprisingly, appeals to women who normally shun shoot-'em-up games. Could this be because women despise creepy bugs and don't mind destroying them? Then too, this game was designed by a woman.



DELUXE INVADERS



CENTIPEDE

SPACE INVADERS

Company: Atari
Language: Machine
Hardware Requirements: 16K

Department: Entertainment
Sugg. Retail: \$34.95
Availability: 10
Disk or Tape: Cartridge

OVERALL RATING	D+	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C+	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	C-	HOLDS INTEREST?	D
GAME DEPTH	C-	GRAPHICS	C-	VALUE FOR MONEY	D

Space Invaders, an Atari cartridge, is a variation of the classic arcade game. Five rows of invaders disembark from a space ship on the left side of the screen. As they slowly march across the screen, they fire continuously at your mobile laser base. When they reach the edge, they drop down one notch toward the ground, and you must destroy every last alien before they reach the ground.

The game doesn't bear much resemblance on screen to the original. The protective castles at the bottom of the screen are gone, and the arcade version never had a space ship positioned at the side of the screen. The graphics use character set animation to achieve movement by alternating two character sets.

Two players can alternate the game play. There are six levels of increasing difficulty, with the upper levels giving the player only three ships, instead of the usual five. In summary, this version is a mediocre version of the classic game.

SPACE EGGS

Company: Sirius Software
Language: Machine Language
Hardware Requirements: 48K, Disk Drive

Department: Entertainment
Sugg. Retail: \$29.95
Availability: 8
Disk: Disk*

OVERALL RATING	B	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	B
CREATIVITY	C+	CHALLENGE	B-	HOLDS INTEREST	B-
GAME DEPTH	B-	GRAPHICS	B	VALUE FOR MONEY	B

Space Eggs is reminiscent of the arcade game *Moon Cresta*. In this colorful Atari translation of the popular Apple game, your three-stage spaceship attacks a group of swirling space eggs. Once an egg is broken, depending on which level you have attained, either a spider, lip, wolf, or fuzzball attacks your ship. You have to kill these monsters with your joystick controlled guns as they dodge, weave, and dive toward your ship. The top stage of your rocket has one gun, the second stage, two guns, and the booster two widely spaced guns. The shape conversion resulted in a booster that takes up a good quarter length of the screen. Each time you lose a stage of your ship, you start again with the lowest level monsters. When you reach 1,000 points, you can dock with a lower stage for a three-gun attack. The upper-level monsters prefer a fast kamakaze attack. The game is cute and challenging; those who like the Galaxian-invaders concept might enjoy this version.

BANDITS

Company: Sirius Software

Language: Machine Language

Hardware Requirements: 48K, disk drive.

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 8

Disk or Tape: Disk*

OVERALL RATING **B+**
GAME CONCEPT **B**
CREATIVITY **B-**
GAME DEPTH **B**

CONTROLLABILITY **B+**
SKILL INVOLVED **B+**
CHALLENGE **B+**
GRAPHICS **B+**

ERROR HANDLING **N/A**
DOCUMENTATION **B**
VALUE FOR MONEY **B**
HOLDS INTEREST? **B**

Bandits is an innovative variation of the familiar Galaxian game, at least in the beginning. You have a ship, one of five that is joystick-maneuverable at the bottom of the screen. Each ship has a limited amount of replenishable shield energy. Shield energy is effective in units of time. Pushing the joystick forward activates the shields, while pulling back deactivates them. The remaining shield energy is shown at the bottom of the display.

In the first two levels, formations of Phalanxes attack singly or in groups of twos, threes and fives. In themselves they are easy to beat, if you avoid their heat seeking missiles. However, if they get past you, they steal your supplies of food or equipment which you are guarding. There is yet another chance to save the pilloined supplies if you shoot accurately as they attempt to escape to base.

When you reach level three, these easy-to-beat Phalanxes are accompanied by deadly Menaces. While the Menaces don't steal your supplies, they preoccupy you, and their missiles are even more deadly; but there is no use in killing the last of these reappearing creatures until all of the Phalanxes are dead.

The next level is a little tricky. This fourth level is a confrontation with the not so friendly Carriers. They look like colorful jacks from a jacks and ball set. The problem is that when one is hit, it breaks up into four bouncing Nusians. This is when using shields becomes necessary. If you manage to defeat these guys, then comes the snake-like Torrents, who attack in centipede fashion. You must kill every last part or they repeat their napalm assault.

Bandits sounds simple except there are 28 levels. All the rest of the levels are combinations of attacking creatures. The game becomes hectic when you are simultaneously confronted with seven Phalanxes, two Menaces, one Carrier, and snake of Torrents. That's just level six, so level 28 must really be a wonder to behold, and a surefire challenge to the local arcade champion. Overall, *Bandits* is definitely fast, fun, and a challenge to play.

CROSSFIRE

Company: Sierra On-Line Systems

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING **B+**
GAME CONCEPT **B+**
CREATIVITY **C+**
GAME DEPTH **C**

CONTROLLABILITY **B**
SKILL INVOLVED **B**
CHALLENGE **B+**
GRAPHICS **C**

ERROR HANDLING **A**
DOCUMENTATION **C**
HOLDS INTEREST? **B+**
VALUE FOR MONEY **B**

Crossfire, a shoot-'em-up contest in which you defend a city's streets from attacking aliens, has its roots in the arcade game, *Targ*. But whereas *Targ* allowed you to shoot only in the direction toward which you traveled, *Crossfire* has expanded the possibilities by allowing you to stop at any intersection and shoot in any of four directions. This has resulted in a more complex game.

You patrol the block-like, grid-oriented streets of a city surrounded by alien creatures. Your gun contains 35 missiles. As you play cat-and-mouse with the advancing forces, you move into an intersection and fire. If you hit an alien, it metamorphoses into another creature worth more points. Occasionally, a bonus shape appears on one of the central streets. If you reach it before firing six more rounds, it is worth points; otherwise it disappears. When your ammunition runs low, a fuel depot appears in the city. With nearly a dozen laser armed creatures gunning for you, the fuel depot is not an easy spot to reach.

Crossfire, a translation of an Apple game, is very challenging, offering effective, smooth, but non-colorful graphics. The joystick control works well. You can remain stationary at an intersection, depress the fire button, and shoot by positioning the joystick in the direction that you wish to fire. (The stick doesn't fire when centered.) You can also shoot on the run in the direction you move. If you can defeat all of the aliens on level one (48 kills), then you advance to the next faster, and more deadly level.

There is little doubt that this is one of the best strategy shoot-'em-ups to come along in a long while. It's a game requiring considerable practice; it remains tough, and one that you won't tire of easily.

HELLCAT ACE

Company: Microprose Software

Language: Machine

Hardware Requirements: 40K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 9

Disk or Tape: Both

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

B
B
C
B-

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

B+
B
B
C

ERROR HANDLING
DOCUMENTATION
HOLDS INTEREST?
VALUE FOR MONEY

N/A
B+
C+
B-

Hellcat Ace puts you into the pilot seat of a World War II fighter craft in this realistic flight simulation. The battlefield is the Pacific, and you must defeat either one or two Japanese Zeros in five separate battles of your choice. Some of the historic battles are Leyte Gulf, Midway, Coral Sea, and Pearl Harbor. The tactics of the Japanese pilots differ depending upon escape or victory flights. Remember, five victories is your goal, so that sometimes it is prudent to retreat and fight another day. Also remember that being shot down once ends the game. It is possible, however, to ditch your crippled plane in the Pacific, or even bail out by pressing the button on your second joystick. Hopefully, you won't be captured.

Your *Hellcat Ace* fighter is controlled by joystick one, but a second joystick allows you to adjust the engine throttle. The plane flies exceptionally well. It can perform loops, split S's, and Immelman turns. This means you can do some pretty fancy flying to shake an enemy off of your tail by first rolling the plane and executing a 180 degree diving loop until you are under him. As you bank to either the left or the right, the ocean horizon tilts. The compass heading and the position of the sun give you your bearing. Pulling back on the stick or pushing forward causes the plane to climb and dive respectively. The plane realistically gains velocity in a dive and stalls in too steep a climb.

Your weapons are two wing-mounted machine guns that are activated through the firing button on the first joystick. A gunsight cursor acts as a guide, but this is a World War II craft and tracer bullets aren't automatically tracked to the enemy plane. Gravity and velocity affect the aim, and you waste a lot of ammunition until you learn to fire accurately. In addition, it isn't easy to tell if you scored a hit because multiple hits are required to down a Zero, with the higher skill levels requiring even more hits.

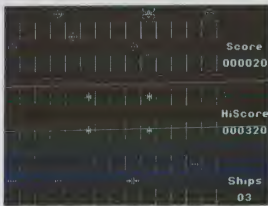
At a distance the enemy appears as yellow specks, but resembles aircraft at close range. It is difficult to tell at a distance if craft are approaching or fleeing, and when they are near their bullets are difficult to recognize until it is too late. The enemy is also dangerous if it gets on your tail. There is an indicator to advise you of this on the instrument line at the bottom of the screen.

As far as graphics go, they are plain but adequate with dark blue water and light blue skies. The graphics are also exceptionally fast: they must use the fastest color-fill routines in the world so that you can roll your plane and the horizon spins smoothly around.

Hellcat Ace is a very good flight/combat simulator and is exceptionally playable. While its graphics are on the thin side, it has enough challenge to interest both novices and experts alike. So far it is the most realistic and fun flight simulator on the Atari market, and one that will hold your interest for more than a few obligatory rounds.



BANDITS



CROSSFIRE

REAR GUARD

Company: Adventure International

Language: Assembly Language

Hardware Requirements: 16K cassette; 32 disk

Department: Entertainment

Sugg. Retail: \$24.95

Availability: 7

Disk or Tape: Both

OVERALL RATING	D	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C-	DOCUMENTATION	C
CREATIVITY	C-	CHALLENGE	C-	HOLDS INTEREST	D
GAME DEPTH	D	GRAPHICS	D	VALUE FOR MONEY	D+

Flying a patrol ship in defense of your last surviving Construction Crew base is your assignment in *Rear Guard*. Three waves of mindless Cyborg-controlled ships (60 in all) attempt to get by you to destroy the base. If only ten escape, the base is overwhelmed.

Your ship is armed with guided energy-darts; and you have an energy shield capable of withstanding ten collisions with an enemy ship or its return fire on the upper levels of difficulty. Alien ships approach from the rear of your craft, which is controlled by joystick. You wait until they pass before firing. On the lowest level, the enemy is simply destroyed; but on higher levels, you must avoid either the ball of debris or return fire just as they explode. On the highest levels there are splinter craft that use a common fuel supply, and a wall of darts that must be avoided after an enemy escapes.

There isn't much substance to this scrolling-style shoot-'em-up game. The ships approach from the rear (hence the name), and you simply blast them as they pass. Although there are harder levels, in which you must avoid debris or darts, the game gets old quickly.

GORF

Company: Roklan

Language: Machine

Hardware Requirements: 16K, disk drive.

Department: Entertainment

Sugg. Retail: \$39.95 disk/\$44.95 cartridge

Availability: 8

Disk or Tape: Disk or cartridge.

OVERALL RATING	B	CONTROLLABILITY	B+	ERROR HANDLING	N/A
GAME CONCEPT	B-	SKILL INVOLVED	C+	DOCUMENTATION	B-
CREATIVITY	C	CHALLENGE	B	HOLDS INTEREST	B-
GAME DEPTH	B	GRAPHICS	B	VALUE FOR MONEY	C+

Roklan has done a very nice job in translating the popular arcade game *Gorf* to the home computer. The game is rather unique, consisting of four separate arcade games linked by a common theme — the destruction of the Gorfian Empire. Four? Yes, they shortened the game a bit by removing the Galaxian segment. The other four, "Astro Battles," "Laser Attack," "Space Warp," and "Flag Ship" are extremely close to the original version. It is still a one or two player game, with each player alternating turns. In addition, players can start on higher levels of difficulty.

"Astro Battles" is very much like *Space Invaders*. The player is shielded by a force field, which descending Gorfian robots slowly penetrate with their anti-gravity bombs. The shield vanishes when you fire your lasers. These quark lasers are unique in that only one shot can be on screen at one time. While preventing rapid fire, it does allow you to redirect shots that are off target without waiting for them to vanish off the top of the screen. When the entire enemy fleet is destroyed you advance to the next mission.

In "Laser Attack," the player must destroy the two anti-particle Laser Ships that simultaneously fire vertical beams at him every three seconds. These Laser Ships, which constantly dart about the screen, are accompanied by a fleet of supporting kamikaze ships as well as Gorfis that dive while shooting at your ship. Once every enemy is destroyed you proceed to the next mission.

In "Space Warp," Gorfis and Fighters emerge in spiral fashion from an eerie web generated by the approaching enemy Flagship. Subquark torpedoes are hurled out of the black center directly at the ship. The enemy must be killed before they reach the edges of the screen.

"Flagship," the final mission, is to destroy the Flagship that is protected by a heavy forcefield arc. The object is to get a clear shot at the reactor power vent in the center of the ship, but first you must blast a hole through the forcefield. This is easier said than done, because the ship hurls fireballs as it moves back and forth. And on upper levels, two Gorfian robots riding on the ship attack kamikaze-style.

Gorf is a tough game that becomes even faster and harder as you progress through the levels. The graphics are good, and the game is quite faithful to the arcade version. It is great fun if you like *Space Invaders*-type games.



REAR GUARD



GORF

GUNS OF FORT DEFIANCE

Company: Avalon Hill

Language: BASIC

Hardware Requirements: 32K; disk drive or cassette player.

Department: Entertainment

Sugg. Retail: \$20 cassette / \$25 disk

Availability: 4

Disk or Tape: Both

OVERALL RATING	D -	CONTROLLABILITY	D	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	D	DOCUMENTATION	C
CREATIVITY	D	CHALLENGE	C	HOLDS INTEREST?	F
GAME DEPTH	D	GRAPHICS	D	VALUE FOR MONEY	D -

Guns of Fort Defiance is a game in which a single artillery piece attempts to defend a half finished stockade in the War of 1812 against a slowly advancing infantry regiment stretched out in a thin line. The object is to decimate these soldiers with various types of projectiles loaded and fired from your cannon.

The display, which has been adapted from the TRS 80 version of the game, is on the text screen. The animation is cleverly done by printing text characters while inhibiting the scroll. When the gun is fired, you can see the steps taken by each gunner (represented by numbers) as they perform their jobs of loading and aiming the cannon. The player's job is to choose the type of projectile: ball, cannister, double cannister, shell, and spherical case are available. You then choose the elevation, either long range or point blank. Aiming left or right is done with the caret keys at the top of the keyboard. Since elevation is rather crude, the game becomes a learning process. You need to remember where a particular type of projectile falls, then wait for the soldiers to reach that position.

While the game might be historically instructive as to the difficulty and inaccuracies of cannon warfare, the game is soon boring and not much fun to play. It is certainly not the type of game that Atari owners are accustomed to seeing on the Atari. The introduction with two slow tunes from the Napoleonic Wars should have the option to be eliminated. The graphics could have been vastly improved.

KAYOS

Company: Computer Magic, Ltd.

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 5

Disk or Tape: Both

OVERALL RATING	D -	CONTROLLABILITY	B -	ERROR HANDLING	N/A
GAME CONCEPT	D +	SKILL INVOLVED	D +	DOCUMENTATION	C
CREATIVITY	D	CHALLENGE	C	HOLDS INTEREST?	F
GAME DEPTH	D	GRAPHICS	D	VALUE FOR MONEY	F

Kayos is a very poorly conceived space shoot-'em-up game. The object is to shoot down the large and small craft that crisscross the top and mid section of the screen. Smaller craft attack your joystick controlled ship at the bottom of the screen in a zig-zag fashion. The background consists of rapidly moving asteroid shapes that are harmless to your ship. In the end, the game has little depth, and becomes boring very quickly.

INTRUDER!

Company: In Home Software

Language: Basic

Hardware Requirements: 16K; disk drive or cassette player.

Department: Entertainment

Sugg. Retail: \$29.95 cass./\$39.95 disk

Availability: 4

Disk or Tape: Both

OVERALL RATING	D	EASE OF USE	C -	ERRDR HANDLING	N/A
GAME CONCEPT	D+	SKILL INVOLVED	C	DOCUMENTATION	B
CREATIVITY	D+	CHALLENGE	B	HOLDS INTEREST?	D
GAME DEPTH	D+	GRAPHICS	D+	VALUE FOR MONEY	D

The mission in this arcade-style game is to shut down four nuclear-powered reactors in the basement of a super secret research installation which have been damaged by an earthquake. The trouble is, that particular level is guarded by two deadly robots, and you are the *Intruder*.

The game, written in BASIC, is entirely animated with character graphics. Movement is a little sluggish, but you and the two robots rapidly take turns moving. The floor space is littered with packing crates. You can push these around to form walls to trap the robots. This strategy, if you can master it, is necessary if you are to survive longer than twenty to thirty seconds. Unfortunately, your speed is the same as that of the pursuing robots, and this gives you precious little time to construct a trap, lure a robot into it, and close the trap again before one or the other of them kills you. There seems to be no way to reach all four reactors with two robots chasing you.

The game is indeed tough, if not impossible. And that is just the apprentice level. Upper levels include replacement robots when one is captured, or as many as eight on the more advanced levels. Even the apprentice level has a time limit.

The game has a good concept, but it may prove too difficult to master before the player becomes frustrated and moves on to another game. The graphics are so-so; and it takes too long to randomly place the scattered packing crates in the room at the start of the game. If you get killed in twenty seconds, you don't want to wait more than thirty to start the next game.

K-STAR PATROL

Company: CBS Software

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$49.95

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING	C+	CONTROLLABILITY	B	ERRDR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C -	DOCUMENTATION	B
CREATIVITY	C	CHALLENGE	C+	HOLDS INTEREST?	C+
GAME DEPTH	C+	GRAPHICS	C+	VALUE FOR MONEY	C -

K-Star Patrol is a shoot-'em-up arcade game in which the object is to lead a patrol of eight Star Ships through ten enemy space sectors on a hostile alien planet. Your mission, as the lead Star Ship, is to destroy the alien ships before they can blast any of your patrol. You are armed with laser weaponry, a protective, hydrogen-activated force field barrier, and three powerful HAPN bombs. Your ship (which is joystick controlled) flies over the planet's scrolling terrain. It can only move vertically, and stays on the left side of the screen just in front of the fleet. Shields are activated by pushing the stick left. Use these sparingly since they require hydrogen power that can only be replenished by carefully dipping your ship into the hydrogen laden crater lakes on the planet's surface. Because of the overly sensitive joystick control, this proves to be the most difficult maneuver in the game. One false move and you either hit the bottom, or one of the treacherous mountain peaks.

The alien attack ships rising vertically from the planet's surface are no match for your lasers. They act as rockets, and lack offensive weaponry. These are aided by ground base laser weapons beginning on level two. However, the most awesome threat are the Intergalactic Leeches that invade the atmosphere, and attach themselves to your lead ship. A Leech will immediately absorb all of your energy, both laser and hydrogen power. If this occurs you must use one of your three precious HAPN bombs, activated by rotating the joystick quickly through all four positions.

K-Star Patrol is fair in the category of shoot-'em-ups. While it isn't as exciting as some, it has good graphics and offers a challenge. My only criticism is the sensitive joystick control that often causes you to lose your ships when attempting to replenish hydrogen in the lakes below. When you have lost all of your ships, the game, of course, is over.

MARAUDER

Company: Sierra On-Line Systems

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING

C+

GAME CONCEPT

B

CREATIVITY

C+

GAME DEPTH

B

CONTROLLABILITY

B-

SKILL INVOLVED

B

CHALLENGE

B+

GRAPHICS

C+

ERROR HANDLING

N/A

DOCUMENTATION

C

HOLDS INTEREST?

B

VALUE FOR MONEY

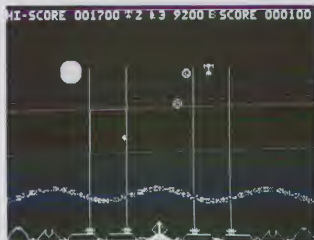
C+

The *Marauder* arcade game is a two level assault on a well-fortified alien city set on a distant planet. The city is defended by a fireball launcher, two aerial mine launchers, two missile bases, two or four turret lasers, and a shield which encompasses the entire city. The object is to destroy all defenses, then enter the city through the crater beneath the fireball launcher. Once beneath the city (in part two of the game), you must navigate the robot-guarded passageways in the subterranean labyrinth in search of the power station. Each of the two parts of the game can be played separately or as a two-part mission.

Attacking the city's defenses in part one can be relatively easy, or impossible, depending on the difficulty of the setting. There are nine levels. The easiest levels have a stationary shield, two turret lasers, and fireballs that do not track you. The more difficult levels have moving shields, more lasers, and fast moving fireballs and aerial mines that home in on your position almost immediately. You have to be quick and alert, and must develop a strategy to deal with each of the weapons. For instance, following a gap in the moving shield is more effective than continually trying to blast your way through in a stationary assault. And the fireball launcher must be destroyed relatively quickly, that is if you can avoid being trapped between two lasers by a descending aerial mine. Overall, this first level is an excellent arcade game by itself.

The second level is similar to the *Berserk* arcade game, with the additional goal of finding and destroying the central power station. The maze of rooms consists of a number of exits and passages guarded by deadly robots. These guards appear only if they are in your line of sight. You must be particularly careful when rounding a corner, because a robot might be lurking out of sight. Your nine marauders (three per ship) are armed with a laser pistol. Each time it fires, the trajectory of the last shot is cut short. Thus, if your shot is on target, you must wait until it kills the robot before firing again. The biggest problem with this level is that the marauder fires his gun off-center, as if he were firing from the shoulder. This would be no problem except that the head isn't always above the body. The orientation of the marauder's body changes with direction. The body would rotate clockwise if you moved the figure first to the right, then down, then left, and finally up. If you switch directly from left to right, you find the marauder upsidown. The blast fires from near the bottom, while a moment before it fired from near the top. As you can imagine, this is very confusing, and, in this case, deadly, for the shot misses a nearby, quick-draw robot.

The game itself is fun to play, and will be liked by those who enjoy navigating multiroom mazes. But with the rooms rearranged after each succeeding level, a player is unlikely to master a route to win quickly in this game. Good fun.



MARAUDER

ALIEN SWARM

Company: In-Home Software

Language: BASIC

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$29.95 cassette / \$34.95 disk

Availability: 6

Disk or Tape: Both

OVERALL RATING **C+**
GAME CONCEPT **C**
CREATIVITY **C**
GAME DEPTH **C**

CONTROLLABILITY **C+**
SKILL INVOLVED **C**
CHALLENGE **C+**
GRAPHICS **C-**

ERROR HANDLING **N/A**
DOCUMENTATION **C**
HOLOS INTEREST? **B**
VALUE FOR MONEY **C**

Alien Swarm is a clever variation on the "invaders" game theme. A swarm of alien bugs are being created by a snake-like figure moving randomly about the top portion of the screen. You are at the bottom of the screen guarding a depot of twenty energy packs needed for your lazer. The aliens' goal is to steal these before you shoot them down.

It takes considerable skill to destroy the alien bugs as they are created. If you miss a few, they begin their deadly assault on your depot. Your lazer pack, which can only hold a maximum of four energy packs at one time, must be periodically recharged by positioning the gun over a lazer in the depot and pushing the joystick forward. If your energy is out, the warning buzzer sounds to indicate you can't shoot. You can retrieve stolen packs by killing the bug before it reaches the top of the screen. But be careful to avoid the falling energy pack. The round is over when you have either been hit, or have lost all of the energy packs.

The complex scoring system earns you extra energy packs for the next round of play. For example, every one hundred points earns you another pack for the next round. When hit, you lose five missile packs plus the energy stored in the energy bar. A counter keeps track of these points at the top of the screen.

The game has a beginner's level as well as the more advanced level. It advances in difficulty as you acquire more points. Saucers appear after 1,500 points, and smart bombs become the penalty for hitting the snake after a score of 5,000 points. For those dedicated arcaders who manage to score over 20,000 points, *Alien Swarm* promises a boomerang tail. Overall, the game is very well done, offering some exciting moments, and requiring considerable skill on the player's part.

THRESHOLD

Company: Sierra On-Line Systems

Language: Machine

Hardware Requirements: 48K, Disk Drive

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 9

Disk or Tape: Disk*

OVERALL RATING **B**
GAME CONCEPT **C**
CREATIVITY **C+**
GAME DEPTH **B+**

CONTROLLABILITY **B**
SKILL INVOLVED **B**
CHALLENGE **B+**
GRAPHICS **B+**

ERROR HANDLING **N/A**
DOCUMENTATION **C**
HOLOS INTEREST **B**
VALUE FOR MONEY **C+**

Threshold closely resembles the arcade game, *Astro Blaster*. The object is to destroy waves of attacking aliens with a joystick controlled space ship. It's the usual scenario, with this exception: the game offers substantial depth and variety. There are 24 types of attackers. Some present easy targets, while others consist of vicious kamikazes who are very durable and elusive. Some fly in formation, while others bounce around the screen erratically. Each has a personality and shape of its own. There are flying fish, revolving spaceships that turn smoothly on their axes, maple tree helicopters, and Volkswagen Bugs.

The player has five expendable ships for the battle. Aiming and shooting is precise and effective, but one's gun may become overheated from rapid firing. If this occurs, one must bide his time dodging bullets while the guns cool. There is a rest period every four levels when the game accesses the disk for the next set of shapes.

The graphics animation is exceptionally smooth for a game that doesn't use player missile graphics. Objects have no problem passing in front of each other. The only complaint is that the moving star field can be confused with the rain of alien bullets. The bullets on a color set appear as colored objects; but they should be made to appear more distinct if not larger to distinguish them from the star field. The sound effects are good and add to the game's enjoyment.

The game will appeal to many dedicated space game fans. The contest has many levels, so that only a few players will reach the end; yet most, driven by curiosity, will make the attempt as the pseudo-addictive element takes hold.



THRESHOLD



SNEAKERS

HAUNTED HILL

Company: Swifty Software

Language: BASIC

Hardware Requirements: 16K; disk drive or cassette players.

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

D
C
D
D+

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

D
C
C
C-

Department: Entertainment

Sugg. Retail: \$24.95 cassette / \$29.95 disk

Availability: 3

Disk or Tape: Both

ERRDR HANDLING
DOCUMENTATION
HOLOS INTEREST?
VALUE FOR MONEY

N/A
C
D+
D

Haunted Hill is a shoot-'em-up game somewhat reminiscent of *Centipedes*, but this takes place in a cemetery. A string of vampire bats snake their way toward you. The object is to destroy the bats before they reach the bottom of the screen. However, if you accidentally hit an intervening cemetery headstone several times it will release an angry ghost. Up to three ghosts can be on the screen at any one time. You can kill these ghosts with your rifle as they randomly move about the screen, but if either a bat or ghost touches you, you die.

Your player is controlled with the joystick. The player can wrap-around and appear on the other side of the screen if he goes off the edge, but he cannot move up or down. Positioning is rather coarse, making the vampire bats difficult to hit. The game itself is not very original; and, with its none-too-accurate control system, it's not much fun to play.

SNEAKERS

Company: Sirius Software

Language: Machine

Hardware Requirements: 48K

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

B+
B+
B+
B

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

B
B
B+
B

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 8

Disk: Disk*

ERRDR HANDLING
DOCUMENTATION
HOLOS INTEREST
VALUE FOR MONEY

N/A
B-
B+
B

Sneakers is a whimsical invader-type game with eight separate groups of characters or targets at which to shoot. Its variety makes this program a cut above its predecessors. Perhaps the most endearing characters are the sneakers and the fangs. Sneakers are cute half-shelled characters with shoe-clad feet that move up and down as they scurry about the screen while attempting to land on your moveable gun turret at the bottom. There are creatures that move in a rocking pattern at the top of the screen, occasionally turning into fangs that plunge to the bottom in an attempt to pierce your gun. Flying saucers that shoot back, cyclops that move lower and lower on each horizontal pass, a meteor shower, and, finally, the deadly scrubs; all inhabit this game.

Some of the creatures are easily defeated while others are dreadfully hard to destroy. If you manage to survive long enough to defeat each of the nine groups of creatures, you advance to a more difficult level. The object of this game, like others of its type, is to score as many points as possible with six expendable ships. Highly entertaining.

SEA FOX

Company: Broderbund Software
Language: Machine Language
Hardware Requirements: 48K, disk drive.

Department: Entertainment
Sugg. Retail: \$29.95
Availability: 8
Disk or Tape: Disk*

OVERALL RATING	B	CONTROLLABILITY	B+	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	B-
CREATIVITY	C+	CHALLENGE	B	HOLDS INTEREST?	B-
GAME DEPTH	B	GRAPHICS	C+	VALUE FOR MONEY	B-

Seafox has elevated the classic (yet boring) two-dimensional "submarine against the destroyers" game into an exciting and challenging shoot-'em-up. It is obvious that the author regards Tony Suzuki and his game *Star Blazer* very highly, for this game has very close parallels. *Seafox* is a multi-level game, and each level presents a different mission. As submarine captain, your object is to destroy merchant ships. The submarine is fully maneuverable beneath the surface by joystick control. Torpedoes can be fired upward at enemy submarines, or at ships on the surface. Red Cross hospital ships must be avoided.

Your sub has a limited fuel supply and must be resupplied frequently from a friendly supply ship that passes near the bottom. A trained dolphin will resupply your vessel. However, it takes very quick maneuvering to intercept the dolphin before a giant clam steals his supply pack. The dolphin doesn't linger long, since it needs air from the surface to breathe.

The upper levels are incredibly difficult. Destroyers harass your underwater position with depth charges in level two, while in upper levels you'll have to survive magnetic mines and shots from enemy submarines. The normally safe, deep waters become a very menacing and deadly environment. Altogether, the game is very good, has detailed graphics (very colorful for a translated Apple game), and is fun and challenging to play.

GENETIC DRIFT

Company: Broderbund Software
Language: Machine
Hardware Requirements: 16K (cassette); 32K (disk)

Department: Entertainment
Sugg. Retail: \$29.95
Availability: 8
Disk or Tape: Both

OVERALL RATING	C+	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C+	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	B	CHALLENGE	B+	HOLDS INTEREST?	C+
GAME DEPTH	C+	GRAPHICS	C+	VALUE FOR MONEY	C

The principle involved in *Genetic Drift* is that one can mutate the four surrounding sets of attacking aliens into a benign life form. Benign in this case means television sets, so take that for what it's worth. The game is basically another of those rapid reflex builders wherein your space fortress is under attack from all four sides. You must aim the ever-ubiquitous gun with your joystick and shoot down the attacking missiles.

The game is much more elaborate than the others of its type. During brief lulls in the attack, you can shoot at the slowly moving aliens. Each hit changes it into another form until, incredible as it may seem, their penultimate state of evolution becomes...yes, television sets. However, if you hit one of the TV sets, it reverts to its lowest evolutionary level (and no, it's not a radio). If any side completely devolves into boob tubes, that side becomes friendly and shoots valentines instead of missiles. However, during the heat of the battle you are apt to shoot at anything that moves, including friendly life forms.

There are numerous higher and more difficult levels wherein the attack becomes much more intense. At level four, enemy satellites join the fray. Unlike most of the games of this ilk that simply continue until you are at last overwhelmed, there is a point at which the player emerges victorious in this one. Broderbund avers that it is a visual surprise. Obviously, this reviewer has not yet achieved that state of nirvana.

The graphics are good and the game is certainly challenging for those who enjoy involved arcade-style games requiring lightning-like reflexes.

FLYING ACE

Company: Avalon Hill

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$31.00

Availability: 4

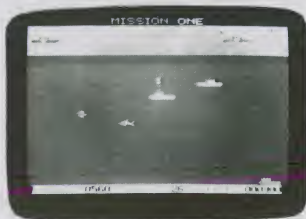
Disk or Tape: Both

OVERALL RATING	C	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	B	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	B	HOLDS INTEREST?	C-
GAME DEPTH	C	GRAPHICS	C	VALUE FOR MONEY	C

Flying Ace puts you in the pilot seat of a World War I biplane. Your mission is to attack and destroy enemy trucks carrying ammunition to the front. Each convoy is protected by enemy planes and banks of ground-based anti-aircraft guns. Otherwise, the moving vehicles are easy targets to a skilled pilot armed with a machine-gun.

The multi-screen battlefield scrolls as you fly. You have landing fields at both ends. The field that you take off from can't be used for refueling because you can't fly your plane behind it, and you can't fly in the reverse direction except upside down at the top of a loop. The plane is highly maneuverable, but only on the pitch axis. Pulling back on the joystick causes the plane's nose to go up; in level flight the plane will climb until it eventually loops. Pushing the stick forward produces the opposite result: the nose will drop. Pressing the joystick button activates the guns. You have apparently unlimited ammunition and fuel, except that if you overfly your landing field you will suddenly run out of fuel and crash. It is important to complete your mission by destroying at least eight trucks, or you are penalized one reserve plane. Enemy trucks are worth twice the number of points as an enemy plane, and the enemy staff car is worth risking your life for in bonus points. It takes several strafing hits to destroy any enemy target.

The game is very sound in its design. It appears to be a well-balanced game, although difficult to play on the beginner's level. Upper levels, which give you less range on your guns and pit you against a harder computer opponent, are nearly impossible. You have to fly dangerously low, at treetop level, to destroy trucks. It isn't a very exciting or addicting game, but it is a good game in that it requires considerable skill. The only thing that you can fault the game for is its graphics, which are chunky and a little crude. Sound effects are minimal.



SEA FOX



FLYING ACE

MOONBASE 10

Company: Program Design, Inc.

Language: BASIC

Hardware Requirements: 32K Disk, 16K Cassette

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 6

Disk or Tape: Both

OVERALL RATING	D -	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C -	DOCUMENTATION	C
CREATIVITY	D +	CHALLENGE	C	HOLDS INTEREST?	F
GAME DEPTH	D +	GRAPHICS	D	VALUE FOR MONEY	D

Moonbase 10 is a space shoot-'em-up game. Here you battle a task force of aliens entrenched on three of Jupiter's moons. The game consists of three separate phases, or mini-arcade games. The entire scenario is tied together by a voice actuated tape, which explains the progress of the game, and gives instructions for each of its various phases.

In phase one, you must navigate your ship through a mine field around Io to a base on the moon's opposite side. It is a rather mindless exercise requiring absolutely no skill. Holding down the fire button as the scrolling mine field moves towards your ship will suffice to clear a path. Little traversing is required, since you can always start on the side opposite of the planet. Planet position is not random, so that you can learn its position after one play. And since you have only one ship at this point in the game, if you make a mistake, you will have to rewind the tape and start over.

Phase two is the battle portion of the game. It is a fast, but crude version of *Invaders*. Character graphics allow creatures to hop about the screen rapidly, and these hopping aliens drop bombs on your lone joystick controlled ship. If you can score 1,000 points quickly enough, you can earn a reserve ship; otherwise, just one mistake and it's time to rewind the tape.

If you defeat the aliens on Io, you repeat the first two phases for two more of Jupiter's moons, Europa and Ganymede. You then confront the mother ship during phase three of the game. It is best to have accumulated several reserve ships by this time. Reserve ships are carried over from one moonbase battle to the next; however, these don't count while traversing the mine fields. You only have one ship during those easy parts of the game.

Overall, the game is boring and a disappointment. While the use of a voice track is novel in the beginning, players don't like the hindrance of restarting the tape each time the game ends, nor the delays between phases each time they play the game.

MOON PATROL

Company: Avalon Hill

Language: Assembly Language

Hardware Requirements: 16K, cassette.

Department: Entertainment

Sugg. Retail: \$25.00

Availability: 5

Disk or Tape: Tape

OVERALL RATING	D +	CONTROLLABILITY	D	ERROR HANDLING	N/A
GAME CONCEPT	C -	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C -	CHALLENGE	C +	HOLDS INTEREST?	F
GAME DEPTH	D	GRAPHICS	C -	VALUE FOR MONEY	D -

Moon Patrol is yet another shoot-'em-up arcade game. Here the object is to guard the Moon against a fleet of attacking alien craft. Your patrol ship's job, as it flies over the scrolling landscape below, is to shoot these aliens down with your laser cannon before they land, or obliterate them on the ground. Your objective is to complete twenty missions. A mission begins each time you take off from the launch pad. If you can defeat what appears to be an endless stream of ships, eventually another launch pad appears, and you must land there at your slowest speed. You have five ships.

Your patrol ship is joystick controlled. Left movement speeds up and right movement slows down the ship. However, the up and down movement is backwards, because climb is down on the joystick and dive is up. Pulling back on a joystick is appropriate for any craft where the view is forward out of the front window, but it doesn't work in a "side view" game in which the ship moves up and down. In these type of games, it is considered natural to push the joystick up to go up. It is easier to play with the joystick upside down even if the speed control is then backwards. The controls are also much too sensitive to do any fine maneuvering in the moon valleys, which is necessary to kill landed craft.

The game has four levels of difficulty, ranging from alien ships that never shoot back, to those that both shoot while landing and while on the moon's surface. You must be careful not to shoot at anything too close, because any collision, even if it's with the explosion debris, will destroy you. And you must learn to dodge ground fire effectively by speeding up and slowing down or you will have a very short game. To make things even more difficult, a random red ship appears that tries to collide with your patrol ship. Overall, the game is a bit simplistic in scope, lacks excitement, and is repetitious. The control system as described above is a problem, and the graphics are plain. It is fun for a while, and can be challenging, but wears thin too quickly.

ATTANK!

Company: APX/Atari Program Exchange

Language: Basic

Hardware Requirements: 24K, cassette; 32K, disk.

Department: Entertainment

Sugg. Retail: \$22.95

Availability: 6

Disk or Tape: Both

OVERALL RATING	C-	EASE OF USE	D+	ERROR HANDLING	N/A
GAME CONCEPT	B-	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C-	CHALLENGE	C+	HOLDS INTEREST?	C-
GAME DEPTH	C-	GRAPHICS	C	VALUE FOR MONEY	D+

Attank! is a two player arcade-style game in which each player battles using two tanks. Because of the inclusion of interconnecting tunnels, which you can either move or fire through, and because you control one tank at a time, the game requires more strategy than the average shoot-'em-up game.

The game is played on a battlefield filled with character graphics terrain features like trees, walls, land mines, rocks, tunnels and rubble. Some of these objects can be blasted away by the tank's guns. Each player's tanks are controlled by one joystick. Left and right turns the tank, forward drives it forward, and back fires the gun. Holding the button down operates the alternate tank. The tanks are character graphics figures rather than player-missile shapes; thus, they move crudely, in eight-pixel jumps. Direction control is also rather limited, as the tank can only move and fire in one of eight directions. Tanks usually have to be maneuvered into firing position, rather than simply aimed (as in tank arcade games).

The interconnecting tunnel system adds an element of strategy to a standard game of tank tactics. The ability to enter a tunnel and magically appear at the enemy's unguarded rear can add an element of surprise. Tanks can also fire through tunnels, so gunfire can be effective in guarding the exit tunnel. The game also has a number of options, such as "night fighting" (in which the battlefield only lights up when a gun is fired), and random aerial bombings that could turn the game into a chance win. Once your two tanks are lost, after ten hits, the enemy wins.

Attank! is a step towards a more intriguing tank battle. The tunnel system is a great idea, but the two tank control system is difficult to use effectively. Four players operating their tanks in teams might be a better solution. Another problem is that tank control is not very responsive. Part of the problem is that the program is written in BASIC. Finally, character graphics animation is not quite suitable for a tank game, whereas player-missile graphics would have produced a more exciting and realistic tank game.

ATTACK AT EP-CYG-4

Company: Bram, Inc.

Language: Machine Language

Hardware Requirements: 16K cassette/24K disk.

Department: Entertainment

Sugg. Retail: \$29.95 cassette/\$32.95 disk

Availability: 4

Disk or Tape: Both

OVERALL RATING	D	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	C-	SKILL INVOLVED	C-	DOCUMENTATION	C
CREATIVITY	D	CHALLENGE	C	HOLDS INTEREST?	D
GAME DEPTH	C-	GRAPHICS	C	VALUE FOR MONEY	D

Attack At EP-CYG-4 is a space shoot-'em-up game in which the object is to wreck havoc on the Tartillian cities on the fourth planet of Epsilon CYGnus. In a sense it is a game of mindless destruction. Your joystick controlled ship flies over sector after sector of alien terrain, and destroys any or all standing buildings with your lyso-blast weapon. There is even a bonus award for total destruction of everything standing within a sector.

There are actually three different scenarios to this game. Each is named after a different starting portal on the planet's surface, and the terrain is different. The terrain, which consists of either flat land with buildings or mountains, doesn't scroll, but instead pages as your ship moves left across the planet. Flight is toward the left only, since flying off the right side of the screen results in wrap-a-round. The only thing that prevents you from rapidly flying deep into enemy territory is an occasional fighter craft or two that must be destroyed before you can proceed to the next sector. These ships are fairly tame on lower levels and are easy to destroy. They do shoot back with very tiny, hard to see bullets. Your ship has shields. However, they are turned off when firing. If you do take a hit, your ship will abruptly drop in altitude, staying aloft long enough to be hit again. Your lasers are aimed with the joystick, which also controls the targeting cursor that moves relative to your ship. Control is a little tricky, but you get used to it.

The game is a little on the dull side. Although it offers some challenge (especially on upper levels where enemy craft are more lethal, and barely discernable ground lasers can pick you off), it isn't a very exciting game. Rather, it is a game of mindless, systematic destruction requiring little thought or skill.

MISSILE COMMAND

Company: Atari

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 10

Disk or Tape: Cartridge

OVERALL RATING	A -	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B +	SKILL INVOLVED	B	DOCUMENTATION	B -
CREATIVITY	B	CHALLENGE	A -	HOLDS INTEREST?	A -
GAME DEPTH	B	GRAPHICS	B	VALUE FOR MONEY	A -

Missile Command is a popular arcade game in which the enemy launches a missile attack against six of your cities. You command anti-ballistic missiles with which you intercept incoming missiles, planes, satellites, and smart bombs.

The cartridge version is very similar to the coin-operated version, except that three missile bases have been replaced with one central base. Each base pops up when the last either has been depleted of its six missiles, or has been nuked. There are thirty missiles per wave, involving underground reloading. This modification was necessary because home computer joysticks have only one fire button, instead of the necessary three found in arcade games. The joystick also replaces the fast and fine positioning features of the original version's track ball. Players shouldn't despair, since the track ball input feature can be activated with the T-key command. With Wico's new track ball, the game again becomes as fast and accurate as the arcade version.

The game, which can be played by either one or two players alternating turns, begins easily with single, slow moving missiles. However, the action soon escalates to MIRV's (missiles that split into multiple warheads), planes and satellites (which must quickly be disposed of before they drop into missiles), and smart bombs that evade explosions on their way to the targets below. The game escalates from bonus level to bonus level until you are eventually overwhelmed, and all six cities are destroyed.

Each level consists of several waves of incoming missiles. The strategy is to protect your anti-missile base, shoot accurately, and intercept the satellite and bomber before they launch their missiles. Bonuses are earned as a multiple of the number of cities and missiles remaining at the end of each wave. Bonus cities are awarded at every 10,000 points.

The graphics and sound effects in the game are very well done. The joystick control, using Atari-type joysticks, lacks the fine positioning needed to accurately stop a smart bomb. This lack is complicated by the fact that diagonal positioning is twice the speed of either vertical or horizontal positioning alone. Although these problems detract somewhat from the game, *Missile Command* is fun and habit forming. It is one of the better arcade games for the Atari home computer.

ALPHA SHIELD

Company: Sirius Software

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 3

Disk or Tape: Cartridge

OVERALL RATING	D +	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	D	DOCUMENTATION	C -
CREATIVITY	D +	CHALLENGE	C -	HOLDS INTEREST?	D
GAME DEPTH	D +	GRAPHICS	D	VALUE FOR MONEY	F

Sirius Software has a knack for translating their VCS cartridges to the Atari computer system without improving game depth, graphics, or sound effects. As a result, their games look like mediocre VCS games—and usually are. *Alpha Shield* is no exception. In it you try to destroy a military base surrounded by a diamond-shaped Alpha Shield that expands and contracts as it rotates. Although you can shoot through several small gaps, you cannot do so fast enough to deplete the base's energy level (shown on a meter). Instead you sneak through the gap when the shield is fully expanded and blast the base before the shield contracts and crushes you.

The base also has other defenses. As you advance in level, the base sends out ships to destroy you. Some wander aimlessly, but others home in on your position. Although not hard to destroy, the ships delay your attack long enough for the base to begin constructing an inner shield, making it more difficult to sneak past the rotating outer shield.

Game play is shallow, but moderately interesting. The graphics and sound are poor even for a VCS cartridge. An asterisk portrays your ship, and colorful explosions flash on the screen. Sound effects border on raspy. The game, finally, hardly deserves an audience for the price.

CARNIVAL

Company: Analog Software

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$24.95

Availability: 3

Disk or Tape: Both

OVERALL RATING

D

GAME CONCEPT

C

CREATIVITY

D+

GAME DEPTH

D

CONTROLLABILITY

C+

SKILL INVOLVED

D

CHALLENGE

D

GRAPHICS

C-

ERROR HANDLING

N/A

DOCUMENTATION

C

HOLDS INTEREST?

D

VALUE FOR MONEY

D

Carnival is yet another shooting gallery game. This version takes its name from the arcade game that appeared on the market two summers ago. It is the typical shooting gallery game with rows of moving targets. However, there is a compartment of moving bonus pipes presented through a very small shooting window, and hitting one of these awards you with more ammunition. Ducks in the bottom row move out of line and slowly work their way toward the bottom of the screen. You have several seconds to destroy them before they eat some of your bullets.

This game, as with most shooting gallery types, is not particularly exciting. It lacks the animation of moving targets; and while it diverts, there is little skill required, and the player will soon tire of it.

TARGET PRACTICE

Company: Gentry Software

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$16.95

Availability: 7

Disk or Tape: Both

OVERALL RATING

D+

GAME CONCEPT

C

CREATIVITY

D+

GAME DEPTH

D

CONTROLLABILITY

C+

SKILL INVOLVED

D

CHALLENGE

C+

GRAPHICS

D

ERROR HANDLING

N/A

DOCUMENTATION

C

HOLDS INTEREST?

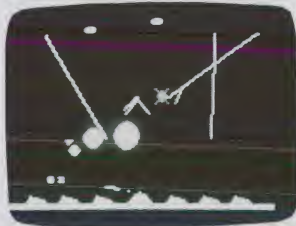
D

VALUE FOR MONEY

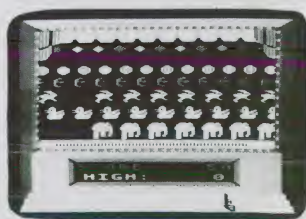
D+

Target Practice is a simplistic arcade game in which you take shots at rows of moving targets with a joystick controllable gun. You have a limited amount of ammunition which can be supplemented if you can hit the diamond target in the top row. The elephants, ducks, and rabbits are easy targets; but the rotating faces in the row above must be hit when they are smiling, otherwise a rabbit is added to the row below. When all of the targets have been hit, the bonus bear appears. Every time you hit the bear, it changes direction. With the gun able to travel only twice the speed of the bear, the slightest miss is likely to allow him to reach the screen's edge before you can shoot again.

The character graphics animation uses colorful, alternating, redefined sets: the ducks flap and the rabbits hop. It is cute and very suitable for young children. Older players will find the game much too easy.



MISSILE COMMAND



SHOOTING ARCADE

A.E.

Company: Broderbund

Language: Assembly

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 9

Disk or Tape: Disk

OVERALL RATING	B	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	B	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	B+	HOLOS INTEREST?	B-
GAME DEPTH	B	GRAPHICS	A-	VALUE FOR MONEY	B-

A.E. (Japanese for stingray) is a shoot-'em-up game in which the objective is to chase out-of-control pollution control robots from the city to the farthest reaches of the galaxy. As in most games of this type, your adversaries attack with a vengeance, in this case in waves of six against your mobile gun position at the bottom of the screen. But unlike most rapid fire games, *A.E.*'s firing system requires a sense of precise timing: your time-delayed projectiles detonate only when the trigger is released. Thus, targets can be hit when they are specks in the distance, or when they appear close up and loom menacingly large.

The graphics are great. Movement slowly transforms the aliens from tiny specks in the distance to full-sized rays in the foreground, as they dart behind planets or in and out of buildings. This creates a three-dimensional effect. They swirl and dive gracefully in a variety of patterns before unleashing their bombs on your gun position. Sometimes they play follow the leader; at other times they attack in pairs or in groups of three. The explosions are nearly syncopated—one of your well placed shots causes a ripple effect, and one ray after another follows the first to its death.

You must kill at least three complete sets of attacking rays before you advance to the next level. Soon you will be chasing them through the solar system out to the farthest reaches of space where killing them is even tougher. While *A.E.* is in many ways more difficult than its competition and offers great graphics and animation, it otherwise differs little from most shoot-'em-up game formats. It does require a little thought beyond mere reflexes, and should be considered by the dedicated arcade player.

BUG OFF

Company: Adventure International

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING	D+	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C-	SKILL INVOLVED	D	DOCUMENTATION	C+
CREATIVITY	D	CHALLENGE	D	HOLOS INTEREST?	D
GAME DEPTH	D+	GRAPHICS	D-	VALUE FOR MONEY	D+

The ultimate in quick reflex, mindless shoot-'em-up games for the Atari computer has arrived in the guise of a game called *Bug Off*. The object is to control a variety of bugs that swarm out of a Florida sinkhole. You have the area surrounded by your joystick-movable DDT gun. As you quickly maneuver around the periphery to the side closest to the bugs, you shoot, shoot, shoot until they're dead. As in the arcade game *Tempest*, bugs generally can't harm you unless they reach the edge. You try to hold out until nightfall when the army drops in a new supply of DDT.

Even games that appear mindless have their rules and *Bug Off* is no exception. Only the wasps and spiders are dangerous to your sprayer. They eat all of your DDT supplies and thus end the game. Less formidable foes, like the bees, attack in swarms and are relatively harmless. As an insect shield they do a commendable job in protecting the wasps and spiders while the pesky moths and centipedes drop off cocoons around the edges of the garden to block your sprayer. The trouble with these insects is that many of them look remarkably alike. It is easier to identify them by their distinctively different movements than by their spaces.

The sound and graphics are poor in *Bug Off*; then again, it isn't the type of game that needed better graphics. Game play is instinctively reflex rather than strategy oriented. It is a lightening fast repetitive game, but that doesn't mean it leaves you with a feeling of accomplishment. It's as if the only goal is to get the highest score possible before becoming bored.



AE



TURMOIL

TURMOIL

Company: Sirius Software

Language: Machine

Hardware Requirements: BK

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 3

Disk or Tape: Cartridge

OVERALL RATING	D-	CONTROLLABILITY	B-	ERROR HANDLING	N/A
GAME CONCEPT	D+	SKILL INVOLVED	D	DOCUMENTATION	D+
CREATIVITY	D	CHALLENGE	C	HOLOS INTEREST?	D
GAME DEPTH	D-	GRAPHICS	D+	VALUE FOR MONEY	F

The object of *Turmoil* is to defeat an armada of enemy fighters that attack you along any of seven horizontal lanes which you are defending. Your joystick controlled ship can move from lane to lane along the central corridor, and then down any of the lanes in either direction if necessary. It is a simple game in which the enemy chooses to ram your ship rather than shoot back. In addition, arrows turn into tanks, and prizes turn into rapidly moving cannonballs if not shot or reached in time. Shooting the tank from behind eliminates it, while a frontal shot only pushes it back.

The game is in the fast reflex shoot-'em-up genre requiring little or no thought to excel at. It lacks depth and is sadly repetitive in each of the faster levels. Don't expect much, for this 4K cartridge is a verbatim translation of a VCS.

ALIEN AMBUSH

Company: Micro D

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 4

Disk or Tape: Disk

OVERALL RATING	D	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	D+	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	D	CHALLENGE	C+	HOLDS INTEREST?	D
GAME DEPTH	D	GRAPHICS	C	VALUE FOR MONEY	D

Alien Ambush is another in a seemingly endless parade of lookalike shoot-'em-up games. This time you defend your joystick-controlled ship against a horde of aliens who attack singly, then split in two when hit. These fragments, actually two smaller replicas of the original, bounce off the screen edges endlessly until you either kill them, or you are destroyed by collision. After defeating half a dozen or so different alien shapes, aliens appear in pairs. While the game definitely becomes more challenging, loss of your ship starts the game from the very beginning again. Thus, unless you are very adept at this game, you will never see any of the more advanced game features. *Alien Ambush* doesn't offer anything new in what has become a tired and trite game formula.

DEMON ATTACK

Company: Imagic

Language: Machine

Hardware Requirements: 16K Cartridge

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING	C-	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C-	DOCUMENTATION	C
CREATIVITY	C-	CHALLENGE	C+	HOLDS INTEREST?	C-
GAME DEPTH	C	GRAPHICS	C	VALUE FOR MONEY	D

Demon Attack is a simple yet fast shoot-'em-up game converted from an Atari VCS cartridge. Its great appeal on the game machine was that it was easy to learn and had eye-popping graphics. The enemy attack fleet was animated, multi-colored, and pulsed. While this was innovative on the VCS machine, an exact translation to the home computer leaves it to stand on its game play merits alone.

The demons from the planet Krybor are bird-like flying creatures: bat-winged goblins, fanged gargoyles, and multi-colored giant moths. They attack eight to a wave and are easy to deal with using your joystick controlled laser base at the bottom of the screen. They appear in stratified horizontal levels. The lower ones drop bombs, but since only a single demon on the upper level shoots at any one time, it is easier to attack the non-threatening troops rather than kill the shooter and then have a backup take its place. At higher levels the invaders, when hit, split into two smaller moth-like attackers. These not only drop bombs, but run kamikaze attacks on your base. By the time you reach the ninth or tenth wave, alien bombs tend to drift toward your base. You later face creatures that rhythmically shrink and return to full size, and by this stage you encounter drifting laser fire as well.

While there is enough of a challenge and variety for even the most advanced game player, *Demon Attack* is a lot like so many other alien invasion games—success depends more on timing than on fast reaction. The game is appealing, but its best selling point on the VCS, namely its graphics, are nothing special on the home computer.

STRATOS

Company: Adventure International

Language: Machine

Hardware Requirements: 16K (cassette); 32K (disk)

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 5

Disk or Tape: Both

OVERALL RATING	D	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	D+	SKILL INVOLVED	D+	DOCUMENTATION	C+
CREATIVITY	D	CHALLENGE	D+	HOLDS INTEREST?	D
GAME DEPTH	D	GRAPHICS	D+	VALUE FOR MONEY	D-

Stratos is a game in which you attempt to defend your shielded city from the destructive powers of a fleet of M'korg space ships. These ships, which attack in waves of three, drop Matter Ravagers (bombs) on the protective shield above the city. The bombs soon punch holes in the shield, and any bombs striking the city's eight flashing energy towers deplete the energy supplying the city's only defense weapon, the AWD, a laser-like device based on Q-energy technology. You control the AWD's aim with your joystick.

In one sense, it is merely another mindless shoot-up-the-invaders game, although not necessarily easy to play. There are a few diversions to the onslaught of wave after wave of destruction that will inevitably destroy your city. You have a repair craft that can be launched between waves to repair holes in your city's shield. This craft is not very controllable, nor is it easy for you to return to the city through a small and invisible entrance. (This craft is to be used in dire emergencies only, because it can be easily picked off by an attacking ship.) The other deviation is the meteor showers that occur all too frequently. The damage to the shield is usually extensive, even if the player is highly skilled.

Stratos is a one-dimensional game with little depth or variety. The game's graphics and sound are mediocre. It offers two levels of challenge, and can be played by one or two players. Stripped to its bare bones, it is an inconsequential shoot-'em-up game that is not much fun to play.

GRIDRUNNER

Company: HES

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 4

Disk or Tape: Cartridge

OVERALL RATING	D	CONTROLLABILITY	C-	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	D	CHALLENGE	C+	HOLOS INTEREST?	D
GAME DEPTH	D	GRAPHICS	D	VALUE FOR MONEY	D

Gridrunner, a translation of a popular and fast-moving VIC-20 shoot-'em-up game, resembles *Centipede* except that you are trapped on a grid and must battle the caterpillar while X and Y Zappers shoot at you as they run across the bottom of the screen. If you knock off the caterpillar's parts one at a time, you have a chance. If you split them, you've got trouble. A further hindrance comes from the pods that impede your movement along the grid.

Although action packed, *Gridrunner* is crude in play mechanics and graphics and has virtually no depth of play. While it was a good game for the VIC-20, it should have remained there.

NIGHTSTRIKE

Company: T.G. Products

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$44.95

Availability: 3

Disk or Tape: Cartridge

OVERALL RATING	D	CONTROLLABILITY	C-	ERROR HANDLING	N/A
GAME CONCEPT	C-	SKILL INVOLVED	C-	DOCUMENTATION	C-
CREATIVITY	D	CHALLENGE	C	HOLOS INTEREST?	D
GAME DEPTH	D	GRAPHICS	D+	VALUE FOR MONEY	D-

The Solitaire Group is back with another mindless shoot-'em-up. The object of *Nightstrike* is to defend a city from a fleet of enemy bombers. A joystick-controlled tank moves along the bottom of the screen. Its tank turret is also steerable and can be aimed along a number of different angles or elevations. Ammunition is 20 mm anti-aircraft shells, but both flak shells and flares can also be loaded by pushing the joystick either up or down before firing. The flak shells are detonated by pressing the button a second time and will destroy any targets within a given radius. Flares are necessary only at the upper levels when the bombers fade into the twilight. The bombers are more aggressive. Two of them fly kamikaze missions and one flies a dangerously low bombing mission. Either type is difficult to hit and is likely to hit you if you don't remain mobile.

Unfortunately, this game boils down to mindless destruction of anything that flies, but don't fire too aimlessly since the bonus award at the end of each level is based on the ratio of shots per kill. The entire game takes place on one screen and becomes old very quickly.

STUN TRAP

Company: Affine Software, Inc.
Language: Machine
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: \$29.95
Availability: 3
Disk or Tape: Disk

OVERALL RATING	F	CONTROLLABILITY	D	ERROR HANDLING	N/A
GAME CONCEPT	D	SKILL INVOLVED	D	DOCUMENTATION	D+
CREATIVITY	D	CHALLENGE	C-	HOLOS INTEREST?	F
GAME DEPTH	D	GRAPHICS	D-	VALUE FOR MONEY	F

Stun Trap is a one or two-player shoot-'em-up requiring some strategy to play. It is one of those games you try to play without reading the instructions. It's obvious that you are to shoot at your opponent and try to trap him by building up hyperspike barriers; however, the random behavior of the multitude of invading ships, and the reappearance of your opponent's ship trapped in nearly the same spot make you feel the game is a bit of a dumb show. The instructions convey the impression that the game was well thought out, yet game play itself is dull and disappointing.

The object is to trap the opponent so that when he is eliminated, the computer won't be able to find a safe spot to place him. The two opponents square off at opposite sides of a playfield, the joysticks control their movements, and the boundary line shifts with the relative fortunes of the opponents. When a player shoots at the boundary behind his adversary, a wall or hyperspike begins to appear. Contact with these will destroy a player except during a 2/3 second interval following the destruction of an opponent's ship. In addition, numerous alien ships are constantly on attack or attempt to collide with both players' ships. Some mine the field as they pass, others home in on your ship. If you have maneuvering space, you can destroy aliens for points, and extra points shift the boundary line between the two players. Thus, the more points you have, the more maneuvering room available.

Stun Trap promises more than it delivers. It's really a boring game, and no one I know who was asked to play it liked it.

TRIAD

Company: Adventure International
Language: Machine
Hardware Requirements: 48K

Department: Entertainment
Sugg. Retail: \$34.95
Availability: 5
Disk or Tape: Disk*

OVERALL RATING	C-	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C+	DOCUMENTATION	C
CREATIVITY	C-	CHALLENGE	C	HOLDS INTEREST?	D+
GAME DEPTH	C	GRAPHICS	C-	VALUE FOR MONEY	D+

Triad combines the usual shoot-'em-up arcade-style game with *Tic-Tac-Toe*. Each of the nine game squares has the picture of one of nine different alien creatures that you have to battle. These nine types are randomly put into each of the squares to offer game variety. If you manage to defeat the bugaboo pictured in that square you receive an O. If you lose, the computer draws an X. Three X's or three O's in a row wins, just like in *Tic-Tac-Toe*.

Each of the nine bugaboos has a different attack pattern. If you don't learn the attack pattern described in the instruction book, you may never defeat them. For example, arrows moving to the right are invulnerable to your missiles. But if you can hit the arrow just as it enters the screen, it will turn and travel to the left. (This is one strategy you will probably never deduce by trial and error.) Some creatures have to be hit head-on to kill them, others from the side. Killer bees can only be destroyed by horizontally-moving arrows. The chessmen are the most interesting. If hit, the pawn will split into a knight. If hit again, it will become a rook, and finally becomes a queen which can be killed. The pieces that were traveling horizontally or vertically will begin traveling diagonally and vice versa.

The game can be played by one or two players using a joystick. In the two-player mode the player who succeeds in defeating the bugaboo will capture the square. He can't win by default as in the one-player game. The graphics are mediocre, but the game play is intriguing and somewhat challenging. Possibly it's too simplistic to be of any long term interest, but it is still worth considering as a purchase.

MOON SHUTTLE

Company: Datsoft

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 6

Disk or Tape: Disk*

OVERALL RATING

D+

CONTROLLABILITY

C+

ERROR HANDLING

N/A

GAME CONCEPT

C

SKILL INVOLVED

C

DOCUMENTATION

C

CREATIVITY

D+

CHALLENGE

C+

HOLOS INTEREST?

D+

GAME DEPTH

C-

GRAPHICS

C-

VALUE FOR MONEY

D

Moon Shuttle is a translation of the arcade game of the same name. The object is to navigate your shuttle through an asteroid belt composed of different sized asteroids, blasting a pathway with your missiles. The first asteroid belt is stationary except for the top band of asteroids that move. Subsequent encounters with these belts add more moving asteroids. Since your ship moves forward at a constant rate and has only back and forth mobility, you need to quickly blast a large hole in order to squeeze through.

Once past the asteroids your shuttle encounters various attackers. The first are the Bomb Launchers. They move wildly about the screen until they are about to fire. Bomb Launchers are easy to kill except if hit when flipped over. The second group to appear (after the second asteroid field) are the Expandos. They resemble hypodermic needles. Since they expand when they are about to fire, they are easier to eliminate than the Bomb Launchers. The third set of attackers are the Man-O-Wars. You have to be quick to kill them for they fire without warning. The last are the menacing Blob Men. When they first appear they are large but split into two smaller men when hit. When you manage to rid the screen of these, the game repeats with faster asteroids and more vicious aliens.

Moon Shuttle is a simplistic shoot-'em-up with little real appeal, and the game never was very popular in the arcades. By far the hardest part is to successfully blast a large enough path through the asteroid belt. Fortunately, when you collide with one you don't have to start over, but advance past the belt to an encounter with the next set of aliens. But *Moon Shuttle* is, unfortunately, drab.

STAR SENTRY

Company: Analog Software

Language: Machine

Hardware Requirements: 24K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 5

Disk or Tape: Both

OVERALL RATING

D

CONTROLLABILITY

D

ERROR HANDLING

N/A

GAME CONCEPT

C-

SKILL INVOLVED

C-

DOCUMENTATION

D+

CREATIVITY

D

CHALLENGE

B-

HOLOS INTEREST?

D

GAME DEPTH

D

GRAPHICS

C-

VALUE FOR MONEY

D

Star Sentry is a space shoot-'em-up on the planet Thule. Alien orbs are changing the planet's atmosphere to suit themselves, thus melting the ammonia mountains on which your base is situated. Your mission is to destroy these orbs and halt the occasional eruption of a high pressure geyser. To accomplish this you are given three joystick-controlled craft.

While the scenario is plausible, game play leaves something to be desired. The game is played on a scrolling screen with orbs remaining practically stationary above the planet. It takes three hits to kill one, and each time you score a hit the orb grows smaller. But there is a twofold problem here. First, the ship accelerates rapidly with just a tap left or tap right, but it is too easy to inadvertently speed it up and engage the hyperdrive. Collision is highly probable since there is no way to destroy an orb that is in your path. Pressing the fire button too soon eliminates your last shot, thus rapid fire is impossible in this game when it is most needed.

The game's graphics and sound effects are mediocre, control is difficult, and game play is only marginal. These problems can definitely make *Star Sentry* a challenge, but it isn't a "fun" game nor will it hold your attention for very long.

WALLWAR

Company: Sierra On-Line Systems

Language: Machine

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING	D	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	D	SKILL INVOLVED	C-	DOCUMENTATION	D+
CREATIVITY	D	CHALLENGE	D	HOLDS INTEREST?	D-
GAME DEPTH	D	GRAPHICS	B+	VALUE FOR MONEY	D

Wallwar is an arcade game in which two players or one player against the computer defend their plasma supply with joystick-controlled Microbots. Each of the combatants are separated by a moving, multi-layered wall of colored bricks. They can each move horizontally by firing lasers that also act as shields for the plasma containers located behind them. The bullets, which each fires at the moving wall of bricks, eventually reach the opposing Microbot or plasma beyond. If a bullet strikes a Microbot in a vulnerable spot, particularly the side blinkers that control the laser steering or perhaps the gunport, the Microbot can be temporarily disabled. These bullets can be fired fast and straight, or they can move slowly but can be directed. The first to destroy his opponent's plasma supply wins.

Wallwar is not an exciting or interesting game. It is a pointless abstract game with exceptionally beautiful and colorful graphics. The player needs to get past the boredom of knocking out a nearly endless supply of intervening bricks before any of his bullets strike a target. While there is definitely strategy involved in the game's play, the game itself is dull. It is, unfortunately, one of those non-entity games with nice graphics.

ARENA 3000

Company: Screenplay

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 4

Disk or Tape: Both

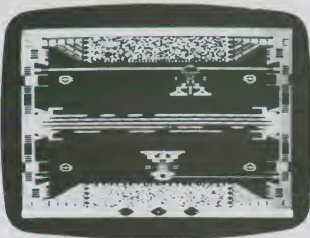
OVERALL RATING	B	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C+	SKILL INVOLVED	C+	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	B	HOLDS INTEREST?	B
GAME DEPTH	B	GRAPHICS	C	VALUE FOR MONEY	C+

Arena 3000 is a fast action shoot-'em-up contest in which the player's joystick-controlled Cyborg must defeat an arena full of dangerous robotic creatures. In some respects it resembles the arcade game *Robotron*, but differs in that there are no humans to rescue. Play is fast and furious with as many as four of your shots on the screen at any one time, and with robots closing in from all sides as you fight for your life.

The game is divided into arenas. Each arena increases in difficulty, and the next level of difficulty is reached upon clearing all of the opponents in the current arena. The opponents in each arena range from as few as ten of one particular type, to as many as forty of all types at the most difficult levels. Some robots move faster than others, while others mutate to another form when struck by a laser. Luckily these mutants, which can take as many as four shots to kill, move slowly enough for you to make a run for it.

There are two methods of joystick control. The easiest uses one joystick and fires in the direction of travel. There is a drawback in that you can't fire behind or to the side when running, and in a game with as many adversaries as you have here, this is a clear disadvantage. The other, less restrictive method is to use two joysticks. One moves the player while the other fires in the desired direction without the button. It takes some practice, but higher scores are worth the effort. One or two players can play the game, although the two-joystick option tends to automatically default to the two-player option whether or not two players are at the computer. On the disk version, finally, high scores can be saved to disk.

The game requires skill. You don't have to start at the beginning of the level when you lose a Cyborg. The same robots remain, but there is a penalty in that they move faster (although the speed does not increase if you finish an entire level). The graphics and sound effects are mediocre, and the attacking character shapes are smooth but unanimated. The explosions, on the other hand, offer some excitement and blow apart a robot in a tall, narrow blast similar to the effects in *Robotron*. This feature helps to make *Arena 3000* a good action packed arcade game that is both involving and fun to play.



WALLWAR



ARENA 3000

EMBARGO

Company: Gebelli Software

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$44.95

Availability: 6

Disk or Tape: Cartridge

OVERALL RATING

D

GAME CONCEPT

D

CREATIVITY

C-

GAME DEPTH

C-

CONTROLLABILITY

B+

SKILL INVOLVED

C-

CHALLENGE

C-

GRAPHICS

C

ERROR HANDLING

N/A

DOCUMENTATION

C

HOLOS INTEREST

D

VALUE FOR MONEY

D

Embargo is a simplistic arcade game in which you must play smuggler on a planet with a strict trade factory and warehouse, then maneuver a shuttle craft past the robot Orelia guards and through a fleet of orbiting enemy ships to a Varox merchant ship waiting above. The orbiting fleet acts only as an obstacle course, but the robot guard near the surface shoots back. Fortunately, you have a laser to rid of this menace; but killing one just summons another. Fuel, which is a minor concern in this game, can be replenished by touching any one of the fuel pods moving to the warehouse. Ten containers must be transported to the merchant ship before moving to the next but harder level. You have four ships with which to accomplish your mission, although you receive an extra every 5,000 points earned.

The game suffers from a lack of depth, but it is an easy and enjoyable game to play. The graphics are very colorful, quite smooth and well animated. The merchant ship's hatch opens when the shuttle craft nears, and trying to stuff all those packages into that small ship is rather a cute trick.

OUTLAW/HOWITZER

Company: APX/Atari Program Exchange

Language: Machine Language

Hardware Requirements: 24K, cassette or disk drive.

Department: Entertainment

Sugg. Retail: \$24.95

Availability: 6

Disk or Tape: Both

OVERALL RATING

D+

GAME CONCEPT

C

CREATIVITY

D

GAME DEPTH

D

CONTROLLABILITY

C+

SKILL INVOLVED

D+

CHALLENGE

C-

GRAPHICS

C-

ERROR HANDLING

N/A

DOCUMENTATION

C-

HOLDS INTEREST?

D

VALUE FOR MONEY

D-

Outlaw/Howitzer is a two game shoot-'em-up package. "Outlaw" has two players challenge each other to a shootout among the desert cactus. The players use their joysticks to move their outlaws around, and to aim and fire their guns. They can hide behind cacti or ricochet their bullets off the screen edges and other cacti to outfox their opponent. The game can also be played against a computer opponent. The game involves a lot of luck, rather than skill, and for that reason soon grows tiresome.

Two enemy tanks confront each other in "Howitzer." A river, which neither can cross, divides the battlefield. The tanks can be maneuvered around the field, and the gun turrets can be raised and lowered for accurate shelling. The shells leave bomb craters when they strike the ground, and extend the river if they hit the shore. The tanks explode in a mushroom cloud when hit, and the entire screen shakes. The first player to score ten hits wins. The game can be played against a computer opponent. Again, there isn't much to this game, and it quickly becomes boring.

SPACE ACE

Company: London Software
Language: Machine
Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 5

Disk or Tape: Both

OVERALL RATING	C	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C-	SKILL INVOLVED	C-	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	C	HOLDS INTEREST?	C-
GAME DEPTH	C-	GRAPHICS	C	VALUE FOR MONEY	C-

Space Ace is an arcade-style space warfare game in which you navigate through an asteroid field while simultaneously fighting off attacking Silurian ships and space bombs. The asteroid field, a smooth-scrolling field, moves down the screen as your ship penetrates it. Blasting a pathway through the asteroids is fairly easy; but the Silurians have mined the field in several places, and occasionally they launch an attack with cunning accuracy.

The enemy launches "space vortexes," which you must avoid. These runaway, whirling blades travel straight down the screen towards your ship and can't be destroyed. But the "space bombs" are even more deadly. They traverse the top of the screen until they are directly above your ship. With a terrifying shriek, they plunge toward you. You're either a sharper shooter, quick to move, or a dead space captain. And finally, a Silurian warship that crosses the top of the screen launches a deadly rain of missiles. The only way to defeat this ship is to hit its small atomic core.

The game has multiple difficulty levels. In the tougher levels your ship traverses the field at a faster pace. *Space Ace* can be considered somewhat challenging, but is not a very exciting game to play.

QUARXON

Company: Atari Program Exchange
Language: Machine
Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING	C	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	C-	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C-	CHALLENGE	C	HOLDS INTEREST?	D
GAME DEPTH	C-	GRAPHICS	B-	VALUE FOR MONEY	C

Quarxon is a shoot-'em-up strategy game for either two competing players or for one player against the computer opponent. The object is to fire the laser on your joystick controlled ship through gaps that randomly appear in the center boundary line, and to hit the enemy's droids behind a multilayered brick wall. Shots against the solid boundary line ricochet into your own brick wall. Shooting through the same gap twice gives the opponent a temporary free shooting zone to inflict maximum damage. The strategy is to keep moving at all times and avoid being hit by your opponent's laser. If this happens, you must quickly maneuver your ship through gaps in the rapidly closing wall. Shooting in this game is nonstop until the end of the battle approaches and one ship destroys all of the opponent's droids.

Although the game has a polished look, it isn't very exciting, nor will it hold your interest for long. Moreover, the computer makes a few mistakes (such as shooting twice in the same spot). It does have the advantage of being a one-player game, and has enough difficulty levels to remain a challenge.

GALAXIANS

Company: Atari, Inc.
Language: Machine
Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$44.95

Availability: 10

Disk or Tape: Cartridge

OVERALL RATING	B-	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	B-	DOCUMENTATION	B
CREATIVITY	C	CHALLENGE	E	HOLDS INTEREST?	C
GAME DEPTH	C	GRAPHICS	B	VALUE FOR MONEY	C+

A warrior fleet of *Galaxians* has come from deep space to attack Earth. Your five Earthships are the planet's only defense. Each attack wave consists of an armada five rows deep led by four yellow commanders at the top. They are

sitting ducks for your mobile ship's laser cannon until several peel out of formation, execute a loop, and begin to attack, shooting continuously as they swoop towards you. If you miss, the aliens disappear at the bottom of the screen only to re-group in formation for another attack run. While they are easy to pick off in formation, they are worth twice as many points while in flight. The commanders are worth even more, and bonuses are awarded if they are accompanied by escorts.

The arcade game is an old classic that follows the much simpler *Space Invaders* game. This version is very true to the arcade version, yet can be easier or tougher depending on the difficulty level. On the beginner's level the warriors don't shoot back, but on the advanced level, seven or eight Galaxians attack simultaneously with an incredible barrage of missiles. No mortal can survive long with those odds.

Multi-colored alien ships are well presented in smooth graphics. The sound is thin but adequate and true to the original game. Responsive joystick control makes this a pleasant and fun shoot-'em-up.

WAVY NAVY

Company: Sirius

Language: Assembly

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING	C-	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C-	DOCUMENTATION	C
CREATIVITY	C-	CHALLENGE	C	HOLDS INTEREST?	D
GAME DEPTH	C	GRAPHICS	C	VALUE FOR MONEY	D

Wavy Navy is an arcade shoot-'em-up game that resembles *Space Invaders* and *Galaxian*. The paddle-controlled gun turret at the bottom of the screen has been replaced by a ship that rides the rolling seas represented by large, slowly scrolling waves. The attack forces are waves of barely intelligent aircraft topped with a row of deadly attack helicopters that home in on your position. The entire attack force remains aloft in *Space Invaders* formation with one or two aircraft breaking out of formation to attack. These dumb aircraft are sitting ducks, and can be lured into a fatal crash dive. The helicopters are another story—they must be dealt with swiftly.

Upper levels become progressively harder. Level two adds a floating mine that inhibits movement by forcing you to keep out of the troughs and up on the crest of the wave. The fourth level adds a persistent bomber who saturates the air with bombs, and somewhere beyond him are missiles that love to skim the wavetops. While the levels do become harder, each level has a boring, repetitive quality to it. The graphics are adequate, but the game is nothing more than a simple rehash of the old *Invaders* theme.

STAR ISLAND

Company: Binary

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 2

Disk or Tape: Disk

OVERALL RATING	C-	CONTROLLABILITY	B-	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	C	HOLDS INTEREST?	C-
GAME DEPTH	C-	GRAPHICS	C-	VALUE FOR MONEY	C-

Star Island recreates the *Star Castle* arcade game for the Atari. The object is to attack an enemy starbase which is surrounded by three rotating, protective energy rings. Your joystick controlled fighter can fire into the ring structure as it thrusts and maneuvers about the screen. Each shot disintegrates a portion of a ring. However, if all the pieces of a ring are destroyed, it will reform. The base protects itself by launching magnetic mines that home in on your ship. These can't be destroyed, but must be out-manuevered by your ship until they eventually dissipate. The ship in the center of the starbase will also shoot back once gaps in the three-layered rings appear. When the base is destroyed you win and may advance to a more difficult level.

It is a fair game and was popular for several months in the arcades two years ago. The graphics look slightly chunky since they appear to be in graphics mode seven, with each of the rings portrayed in a different color. In the ranks of shoot-'em-ups, *Star Island* is fun to play, but like so many of the rest, it becomes repetitious due to a lack of game depth.

Racing Games

BAJA BUGGIES

Company: Gamestar
Language: Machine Language
Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$31.95

Availability: 4

Disk or Tape: Both

OVERALL RATING	B	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	B	HOLDS INTEREST?	C+
GAME DEPTH	C	GRAPHICS	B	VALUE FOR MONEY	B

Baja Buggies is a road racing game in which the object is to finish a grueling cross-desert race in one of the top six places. You start the race in 80th place. This means that, while not driving recklessly enough to crash, you really have to haul ass to win this race. It requires intense concentration, because you must avoid crashing into other cars that are bent on forcing you off the road.

The road course, which vanishes off in the distant hills, moves toward you. Its simulated 3-D effect is much like the old *Night Driver* arcade game. The course, which twists and turns, requires you to steer with the joystick controller. The firing button acts as a brake; and it must be used often, to avoid rear-end collisions with slower vehicles, and to hold the road in sharp turns. The background hills and fluffy-clouded sky add realism and the feeling of space to the game by shifting on the turns.

Beginning drivers will have a tough time finishing the race. If you run off the road too often, or have too many crashes, your buggy will break down, ending the race. More seasoned drivers, who manage to pass all cars behind the eight race leaders (shown as moving white lines on the radar screen), will find the pack difficult to catch before they cross the finish line. In one particular race, I managed to reach 9th place with a good quarter of the course to go, but I was unable to see or pass another buggy while driving the car flat out for over 45 seconds. I was expecting to pass a car at any moment because the radar showed that my car had caught the rear of the pack a good ten seconds before the race ended. These long gaps between passing the last of the trailing cars and catching the leaders cause you to lose interest in the game. Another drawback is that once the winners have finished, you can no longer improve your place because the game abruptly ends.

There are three racing courses. They are randomly created, and so put more emphasis on driving skills than on strategy. There are also two levels of difficulty, pro and amateur. At the amateur level opponents are more predictable, and they travel at a slower average speed. *Baja Buggies* is a nice looking game, and definitely a blast for one player. Continually breaking down may be frustrating during your first few races, but the game will grow on you as your skill increases.



BAJA BUGGIES



POLE POSITION

POLE POSITION

Company: Atari

Language: Machine

Hardware Requirements: 5200

Department: Entertainment

Sugg. Retail: \$40.95

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING	A	CONTROLLABILITY	B+	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	A	DOCUMENTATION	B
CREATIVITY	B	CHALLENGE	A	HOLOS INTEREST?	A
GAME DEPTH	B+	GRAPHICS	A	VALUE FOR MONEY	A

Atari has done a magnificent job in translating *Pole Position*, their top racing arcade game, to the 5200. It is a racing game in which you must qualify on the track before you are allowed to race. You have up to 90 seconds of qualifying time, but must complete the lap in less than 74 seconds if you are to race. The computer then determines your starting pole position. If you get stuck at the back of the pack, you will have to do some fancy maneuvering to get out ahead.

The game's graphics are simply outstanding. The perspective view is as if you were towed fifty feet behind your car ten feet off the ground. The roadway is blacktop with red and white stripes delineating the boundary from the surrounding countryside. As you follow the twisting, turning roadway using your joystick controller, the trees on the horizon and the clouds in the sky scroll by. Roadway signs appear in the distance and gradually become larger. Unlike the arcade version, these signs are blank. The sound effects are engine revs, a different pitch for each gear. There is even the screeching sound as you corner hard and the bumpy sound of riding on bricks if the car ventures slightly off the pavement.

The game is controlled by a joystick. One button is the accelerator, the other acts as a brake. Pushing the joystick forward puts the car in low gear, and pulling back puts the car in high gear. Speeds as high as 195 MPH are possible on long straightaways. However, you will have to brake or downshift if you expect to navigate a tight turn. Avoiding the other cars on the track requires practice.

There are three different racing courses in addition to a practice course. You can select up to an eight-lap race, but you must complete each lap within a certain time or you won't reach the next lap. *Pole Position* is definitely the most realistic racing car arcade game on the market and a must buy for any racing fan.

ION ROADWAY

Company: APX/Atari Program Exchange

Language: Machine

Hardware Requirements: 16K Cassette, 24K Disk

Department: Entertainment

Sugg. Retail: \$24.95

Availability: 4

Disk or Tape: Both

OVERALL RATING	C+	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C	DOCUMENTATION	C+
CREATIVITY	C	CHALLENGE	C+	HOLOS INTEREST?	C+
GAME DEPTH	C	GRAPHICS	C-	VALUE FOR MONEY	C+

When you enter your five cars in *Ion Roadway*, you race against a team of robot cars doing their best to kill you. They may flank you and squeeze, line up and force you into the wall, batter you from the rear, or zigzag in an attempt to collide. If your cars collide, you are ejected while your car explodes in a mushroom cloud. Luckily, your parachute drops you into a waiting car to rejoin the race.

You control cars with a joystick. Up and back control the gears (reverse, neutral, first, second, third, and fourth). Left and right moves the car left or right. Combining left and right with gear changes lets you maneuver along the diagonally scrolling track. Energy platforms for refueling sometimes require you to reverse to line up properly. Small black posts along the road change to large green ones in a random pattern. You earn one to three thousand bonus points for hitting a green post while in third or fourth gear. You may lose control momentarily, but spinouts can also help you lose a robot car (at least on the less crowded lower levels). As you lap the track, your score builds, but as the race continues, more and more robot cars impede your progress until ten robot cars share the track with you.

A fast action racing game, *Ion Roadway* presents a fair challenge. The visual effects are nice, especially the spinouts, but the race cars look like tractors and the track is straight and featureless except for scattered trees. This means less competition against the track, but why worry? In this racing game, the competition is out to kill you.

MATCH RACER

Company: Gebelli

Language: Machine

Hardware Requirements: 16K; disk drive or cassette player.

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Both

OVERALL RATING	C +	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C +	SKILL INVOLVED	C +	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	C	HOLDS INTEREST?	B
GAME DEPTH	C	GRAPHICS	B -	VALUE FOR MONEY	C +

Match Racer is a racing car game for either one or two players. It uses the Atari's fine scrolling graphics capabilities to produce a realistic obstacle race course. The course, which scrolls vertically from top to bottom, is filled with barricades, oil slicks, ice patches, tunnels, and rocks. The two cars, which jockey for position, can lock wheels and force each other off the road. When a car is bumped on an oil slick, it slides from side to side with a whooshing sound. A car struck while traveling on ice can lose control. And cars that bounce up and down on the brick surface portions of the course actually sound like they are driving across brick.

The two cars are rather large for the size of the course. It becomes obvious that if the car in front crashes in some of the winding sections, the trailing car can't get past, and will crash into the wrecked car. Reaction time, as in most racing games with vertical scrolling, is very short — especially for two cars following one another. Thus, it would have been much better to have scrolled the game horizontally.

The game can be adjusted for initial skill level, and speeds up as it progresses. The speed changes at 5, 15, and 45 miles on the odometer. Negotiating the course at the highest speed level seems impossible.

Match Racer is an enjoyable game for two players who want to vent their aggressions on each other. However, the game is very boring in the single player mode. The bad feature of the game is that you can't restart it once the game has already begun. You will either have to play the game to the finish, or deliberately crash all of your cars to end it. The graphics and sound effects are the best features of this game.

HAZARD RUN

Company: Artworx

Language: Machine

Hardware Requirements: 16K; disk drive or cassette player.

Department: Entertainment

Sugg. Retail: \$27.95 cassette & disk

Availability: 3

Disk or Tape: Both

OVERALL RATING	D +	CONTROLLABILITY	D	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C +	DOCUMENTATION	C
CREATIVITY	C +	CHALLENGE	C +	HOLDS INTEREST?	C -
GAME DEPTH	C	GRAPHICS	C	VALUE FOR MONEY	D

Outrunning the good ol' Sheriff through a hazardous course of tree trunks, boulders, fences, barnyard chickens, canyon wall, and the Deputy's car blockading the entrance to the bridge is the object of *Hazard Run*. It sounds like the plot of a Burt Reynolds movie, and the only escape is to put the pedal to the floor and jump Moonshine Creek. If the game had even half the excitement of the movie it might have been a winner.

You control an unwieldy car with your joystick. It continuously accelerates, unless the joystick button is held down to brake it. The car, which steers from side to side by moving the joystick, pivots when turning, rather than turning smoothly as a real car would. The car's wide profile hits objects that you would rather avoid. Combine this with a car that is very sluggish to control the faster you drive, and you have a game that isn't much fun to play because you constantly have to slow it down.

Each of the four different courses scrolls vertically downward as you drive. Your car stays level with the bottom of the screen. If the Sheriff is chasing you, he is never seen. If you hit an obstacle head on, the car flips and you lose a man. But sometimes you sideswipe one that tips you up on two wheels. This is great for clearing narrow gaps; but if you turn your wheels the wrong way, the car will flip. The longer courses require extra gas. To survive, your car must touch hazardously placed gas cans.

When you are trapped, and must jump any of the various creeks and ponds, your car must be going top speed. The view shifts to a side view of the car slowly sailing from one high bank to the other across the water. If you aren't going at least 60 MPH, the car plows into the opposite bank and drops into the drink. Because you can't get up to that speed in one screen length, you need to memorize the course to make the jumps.

The game has its moments, but in general is too frustrating to want to play for very long. The graphics are alright; but the car steering system and response must be considered primitive. Not a good bet.

SPEEDWAY BLAST

Company: Innovative Design Software

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING **C+**
GAME CONCEPT **C**
CREATIVITY **C**
GAME DEPTH **C**

CONTROLLABILITY **B-**
SKILL INVOLVED **C-**
CHALLENGE **C-**
GRAPHICS **A-**

ERROR HANDLING **N/A**
DOCUMENTATION **C**
HOLDS INTEREST **C+**
VALUE FOR MONEY **C-**

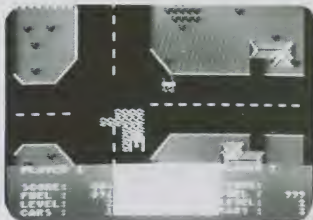
Speedway Blast is a nicely animated scrolling arcade game in which you speed around the neighborhood in an attempt to destroy the invading asphalt-eating monsters and their eggs. The location of the monsters and their hatchable eggs are displayed on a map at the bottom of the screen, much in the same manner as in *Rally X*. As you drive and blast your way around the neighborhood streets, fuel is expended. This is replenished by running over the eggs. Although monsters don't shoot back, your car can be lost by hitting them or their holes, or by crashing into other objects (e.g., houses, trees, or bridges). When you clear the board of all monsters and eggs, you go on to the next level: it is the same neighborhood, just more monsters and eggs.

The car is fast and slightly difficult to control. Unlike most arcade racing car games that reverse direction immediately, this car requires a small radius U-turn. It just takes a little practice to learn to avoid hitting obstacles. The car is accelerated and decelerated by pushing forward and pulling back on the joystick.

The graphics are the best thing about this game. The neighborhood is a very colorful rendition of streets, houses, and landscaping, all smoothly scrolling as the car patrols the streets. The car is pretty much centered during the movement. The game, although fast-paced, lacks excitement. There is no chase, as in *Rally X*, or even any worry about return fire. The monsters merely hatch, then slowly move around digging up the streets. Your job is to kill them as fast as possible without crashing or running out of fuel. You have three cars with which to gain as many points as possible. It is a nice game, but one that has little going for it in terms of prolonged play.



HAZARD RUN



SPEEDWAY BLAST

Pinball Games

A2-PB1 PINBALL

Company: Sublogic

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING	A	CONTROLLABILITY	A	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	B	DOCUMENTATION	A
CREATIVITY	B	CHALLENGE	B+	HOLDS INTEREST?	B+
GAME DEPTH	B	GRAPHICS	A	VALUE FOR MONEY	B+

A2-PB1 Pinball, the most realistic pinball simulation yet to appear on the Atari, will please the hard core pinball fan. This version, called "Night Mission," follows the classic design features of modern pinball games, yet does not attempt to copy any one machine. Overall, with its five bumpers, seven standup targets, nine rollovers, two spinners, a dive bomb chute, and a hole kicker, it makes a very exciting game. The actual layout is also well designed, with no dead spots.

Bruce Artwick went a long way in the realistic design of this game. He includes features not normally expected in a computer version, but features that are nonetheless an integral part of a real machine. He includes a quarter coin slot and start procedure for multiple opponent play identical to that of an actual machine. In addition, he includes the match feature for a free game. By studying and measuring the features of numerous mechanical pinball games, he concluded that there was no average set of parameters that would suit a majority of players. Thus, rather than compromise, he allows the player to adjust the parameters to suit himself.

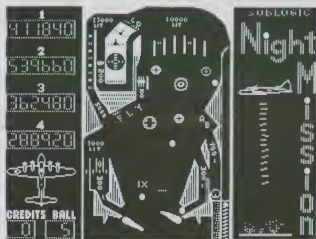
Thirty-three individual parameters can be adjusted. The variations are so different that ten of the modes are preset with easy access by setting only the mode number in the FIX mode. Others that the user can specify can either be set for one time play, or be saved to a separate disk. (One mode and one high score on a disk.) For example, you can vary the impulse and time delay of the hole kicker, the tilt sensitivity (yes, there is a tilt triggered by the keys on the left and right side of the keyboard), ball speed and trails, bumper impulse, flipper power, spinner friction, and forward incline of the machine. There are others that affect the sound and the scoring. One adjustment called "ball trails" gives a "cosmic effect," in which a ball appears as a slinky as it bounces around.

Atari owners are dismayed when they hear the game sounds emanating from the small keyboard speaker (a la Apple computers) rather than from their television set. This is, of course, an Apple computer translation, but the author missed a chance to improve the fidelity of some truly unique sound effects. Effects range from the drone of an airplane engine to high pitched whistles and explosions. After all, the game follows the theme of a B-17 on a night mission over Japan, where various cities are the targets. That is why the game's layout includes a bomb release line (vertical chute), and a dive bomb chute (U-shaped tunnel with a spinner at the end).

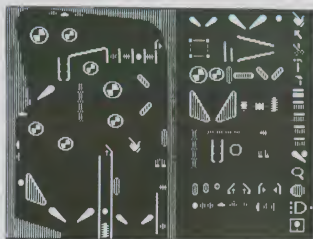
The graphics are stunning and rich in fine detail. There is a considerable amount of fine, detailed writing on the playfield that shows up clearly on a color monitor, and doesn't interfere with the drawing of the ball. The background colors can be adjusted with the joystick controllers. The problem here is that if you touch the stick position during play it will change the colors. There should have been a lock command for this.

While it is hard to judge a particular setup for ease of play, many of the preset modes act, and more importantly *feel*, as if you are playing a real game. I personally disliked the play of the competition mode because it felt almost as if the machine was playing by itself with its high speed ball and its strong bounces off the kicker. However, the easy and medium difficulty modes were realistic. One nice feature that has been lacking on other simulations, and works as expected, is a still or quiet ball held by an activated flipper. I know many people who complained about balls that oscillated in other pinball versions; the balls appeared as if they were about to escape from the flipper.

In summary, I should say that *A2-PB1* is the most versatile of all the pinball games for the Atari.



A2-PBI PINBALL



PINBALL CONSTRUCTION KIT

RASTER BLASTER

Company: Budge Co.

Language: Machine

Hardware Requirements: 32K, Disk Drive

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Disk*

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

A -
A
B
B

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

B
B
B
A

ERROR HANDLING
DOCUMENTATION
HOLDS INTEREST
VALUE FOR MONEY

N/A
B
B
A

The sensation of playing an actual pinball machine is now available with the introduction of *Raster Blaster*. Bill Budge worked for over six months to faithfully reproduce the Bally's pinball game, *Firepower*. His attention to detail is astonishing. The rubber bands on the bumpers jump and the action of the claw mechanism and the spinners act like their electromechanical counterparts. Two joystick buttons activate the pair of flippers. The strength of the spring ball launcher is set with the joystick. The ball behaves amazingly like that of a real game. Except for an occasional freaky bounce, the ball is true. Aiming the shot is a little harder with the flippers than in the real game. Judging the strength of a shot is nearly impossible unless you trap the ball with the flipper.

The game is for one to four players with two levels of play. On "easy," the side chutes are closed, while in the "hard" mode, they close after you activate two sets of center targets. Filling all six center targets enables the *Raster Blaster* claws. Any balls shot into claws are caught, and the player is given another ball. If all three are caught, they are released simultaneously for multiple ball play. There are lane lights at the top, a set of targets on the right side and, of course, a spinner.

Budge's Hi-Res raster graphics are superb. He has included numerous sound effects to enhance the simulation of the newer electro-mechanical pinball machines. It is *the definitive* pinball game for the Atari. Hopefully, Budge will convert other popular arcade pinball games to the Atari.

Budge's Hi-Res graphics on mode eight are superb, but lack much of the color they had in the original Apple version. Because of the speed differences between machines, the ball in the Atari version moves about 30% faster, just a little too fast for a real pinball game. They had to sacrifice the tilt feature in the translation because of differences in the controllers. The sound effects are a great disappointment. While they should have been better on the Atari, they are instead an annoying series of bleeps. Nevertheless, *Raster Blaster* is a superb recreation of a pinball game.

PINBALL CONSTRUCTION KIT

Company: Electronic Arts

Language: Machine

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$40.00

Availability: 8

Disk or Tape: Disk

OVERALL RATING	A+	CONTROLLABILITY	A+	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	N/A	DOCUMENTATION	B
CREATIVITY	A+	CHALLENGE	N/A	HOLDS INTEREST?	A+
GAME DEPTH	N/A	GRAPHICS	A	VALUE FOR MONEY	A+

So you have played *Raster Blaster*, *Midnight Magic*, and *Night Mission* and you think that they'd be a little more exciting if only the programmer had added another bomber, perhaps another spinner, and a drop target for added scoring potential. Close your eyes and imagine the perfect electronic pinball game. It has two sets of flippers at the bottom, the second pair offset wider above. Lane lights alternate with spinners above a forest of bumpers that give extra action and thousands of points as the ball or balls carom endlessly around the playfield. Drop targets...

The Pinball Construction Kit is a pinball wizard's dream. It allows the user to design a playable pinball machine from a parts box of forty-two components. The parts box, which sits to the right of the designer's playfield, displays all components so that you can select and place any individual one anywhere on the field of play.

Perhaps the best way to describe the ease of this process is with the term "exceptionally human engineered." You can manipulate any of five tools solely with a joystick and one push button. You will use the hand tool most often. By positioning it over the component to be moved and depressing the button you can place the component anywhere on the playfield to the nearest pixel position. If you change your mind, just move it again, now or later. You can remove parts from the board as easily as place them. You simply move them back to the vicinity of the parts box, and they disappear once you release the hold button.

The first thing you'll need to do is to put some of the basic pinball parts into place. You'll need a ball launcher. It doesn't have to be in its traditional spot; it can be on the left, in the center, or even near the top. Then add a pair of flippers to keep the ball in play. Two different sized flippers can be added either in pairs or singly. You can have two or three pairs of flippers; they all work, no matter where you place them. In fact, all of the parts work no matter how many you place or where.

You have a practically unlimited choice of parts: two sizes of round bumpers and four rectangular ones; kickers and knockers to kick the ball selectively; and two drop target sets to turn on as each of the four parts is struck and then reset. A ball hopper catches balls; it can hold two, and will free all the balls for multi-ball play when it catches a third. There are also lanes and gates to direct balls, rollover lights, a spinner and targets for more scoring, and a magnet that holds on to a ball for a second or two. Last but not least, a ball disintegrator, or hole, eats balls.

The set contains a number of tools to help with the finishing touches. Most pinball games have obstacles to keep the ball within certain boundaries whether on the edge or in the middle of the playfield. You can place a square obstacle anywhere, color it with the paintbrush, and then stretch its shape by dragging the boundary knobs with the painter tool. The hand tool can even move the obstacle about. A polygon with four knobs isn't very useful, so you can add more with the hammer or delete one with the scissors. The entire process is simple, but you must remember to color the polygon while it is still a square shape or you will have a stretched polygon with lots of knobs and no way to fill it in.

No pinball game would be complete without the name scrawled on an empty section of the playfield. A special paintbrush with a magnifier makes it possible to add the fine artistic touches. You can pick a small area to paint on the playfield, then move the joystick controlled paintbrush to the magnified view on the right side of the screen where the parts box used to be. Any of the Hi-Res colors are available, and there is even a grid option.

Of course, pinball pieces come from the parts box with preset values for sound and scoring. You can use the joystick cursor to change these by selecting the AND GATE icon. When you select a piece on the playfield, the score and sound is highlighted. You can change these values from the from the displayed menus. You can also select the conditions to allow a player to score a bonus. Moreover, you can decrease or increase gravity, the ball speed, the kick strength of the bumpers, and the elasticity of the collisions between the balls and the polygon surfaces.

Once you have completely designed a pinball game, one to four players can play with either two paddle buttons or both buttons on a single joystick. You can also save it to another disk in the form of a BRUNable file. You are free to do with the game as you like, which means you can give the game away to your friends, or even sell it.

In sum, Bill Budge has created a remarkable program that is well engineered and a delight to use. The *Pinball Construction Kit* can create pinball games of a variety only limited by the user's imagination. Although I've met a

considerable number of game players who don't enjoy electronic pinball, the vast majority were totally fascinated with the construction of their own games. The package is reliable in every sense, one of the best designed programs I have ever seen, fun to use, and definitely worth owning.

BULLDOG PINBALL

Company: Hayden Software

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 3

Disk or Tape: Tape

OVERALL RATING	D	CONTROLLABILITY	C-	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	D	DOCUMENTATION	C
CREATIVITY	D	CHALLENGE	D+	HOLDS INTEREST?	D
GAME DEPTH	D	GRAPHICS	D+	VALUE FOR MONEY	D

Bulldog Pinball, a very mediocre pinball simulation, gets its name from the resemblance of the upper portion of the playfield to a bulldog's face. The nose and two eyes are bumpers, the mouth forms barriers, and the ears are made up of targets. The flippers, controlled by two joystick buttons, are very responsive. The elasticity coefficient of the ball against the flippers is so high that it is hard to trap it. Even when trapped, the ball oscillates enough to roll off into the gutter.

The game has a good deal of action, but the two barriers that make up the mouth tend to cause you to quickly lose the ball between the two flippers. Control of the spring tension on the ball release is tricky. It is activated by holding down the shift key, and its tension is supposedly interpreted by a tone pitch. Another shortcoming is that the board isn't very colorful—just blue and green against a black background. Moreover, the sound effects are minimal. All things considered, *Bulldog Pinball* is not an impressive pinball game.

DAVID'S MIDNIGHT MAGIC

Company: Broderbund

Language: Machine

Hardware Requirements: 48K, disk drive.

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 9

Disk or Tape: Disk*

OVERALL RATING	A	CONTROLLABILITY	A	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	B	DOCUMENTATION	C+
CREATIVITY	B	CHALLENGE	B+	HOLDS INTEREST	B+
GAME DEPTH	B-	GRAPHICS	B+	VALUE FOR MONEY	A

David's Midnight Magic is a spectacular, double-decker pinball game. It is absolutely realistic in its approach to pinball games like *Black Knight*. These games, which have both upper and lower sections, are interconnected by ramps. There are sets of flippers on the bottom and top levels. These flippers respond as accurately as any of their electromechanical equivalents, with no erratic bounces.

The game is action-packed, with a variety of targets included on both levels. There are various drop targets, some of which activate the Magic save, which can save a ball that falls through at the side chutes. Unfortunately, these are activated from the keyboard, as is Tilt. This makes things somewhat awkward in use, and requires you to hold two paddles and their buttons. Other targets trigger the multiple bonus feature, or release balls that are trapped in the upper ball collector. If you can trap three balls in this S-shaped collector, all three balls can be played simultaneously. There is also a loop that connects one level to the next. This is worth extra bonus points. Kicking a ball through the loop after obtaining a 5X bonus results in being awarded an extra ball.

High scores can be saved to the disk if it is unprotected; otherwise, high scores are maintained only temporarily for the evening's play. There is also a pause control in case the phone rings; fine, if you are going for a record score.

The simulation and graphics are great, although not as colorful as the Apple version. Colors on GR.8 are limited to blue, green and white. It is a little more difficult to discern which targets are still up, especially on the top level, as the targets blend into the screen.

If you are a pinball fan or loved *Raster Blaster* this game is worth owning.

Maze Style Games

WAYOUT

Company: Sirius Software

Language: Assembly

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING	B	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C+	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	B	HOLOS INTEREST?	C+
GAME DEPTH	C-	GRAPHICS	A+	VALUE FOR MONEY	C-

Wayout is a three-dimensional maze game in which the sole object is to find the shortest way out of the maze. Fortunately, you're supplied with both a compass and a mapmaker which will help you find the often elusive flashing rectangle that marks the exit. While it sounds like an easy task, it isn't. Although you can sometimes see the exit as in the introductory maze, there is a stiff wind blowing from it that prevents your moving directly toward the exit. You'll find that the only way to reach it is to sneak up from the side, if you can find the correct corridor in the maze. It wouldn't be much of a challenge if it weren't for the Cleptangle, a playful sneak thief who is your nemesis throughout the game. Each time it touches you, this revolving orange and white critter steals either your mapmaker or compass, sometimes both. To get them back you have to corner the thief in a cul-de-sac of the maze.

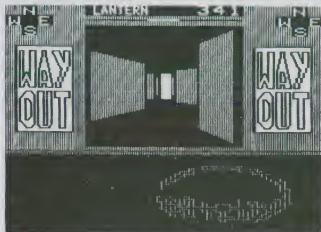
The graphics in this game are outstanding. The walls of the maze, presented in mouse-eye fashion, move in a fluid manner as you travel or turn, using a joystick controller. The screen is divided into two portions, the upper two-thirds showing the three-dimensional interior view, and the lower portion showing the areas of the maze that your mapmaker tool draws as you explore. A blinking dot shows your present whereabouts. Compasses in the two upper corners show your direction of travel when they are working, and an odometer at the top counts your steps.

The strategy is to explore the maze rapidly before your first encounter with the Cleptangle. There is a warning buzz when it is in your vicinity, and you can often see it when it is in front of you, so you can try to avoid it. However, it finds you fast, and many of the corridors are dead ends, so be prepared to lose your tools early. The best bet is to give chase and recover your tools quickly, for you'll never find the exit without them. Encounters with the Cleptangle are numerous enough to be annoying. There are a number of fireflies floating through the maze on wind currents. They are supposed to help you find the exit, but actually provide little help.

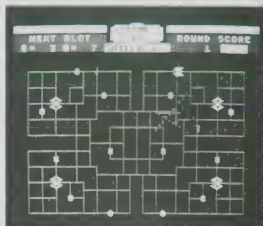
There are twenty-six different mazes on the disk. Some are easy to solve with an expected exit on the periphery, while others are diabolically difficult with exits hidden in interior U-shaped hallways. Although you may figure that once you learn a maze it is useless to play it again, you will still find it a challenge since many of the mazes look alike from the inside. Besides, you can try to find the exit in fewer moves.

The game features a save game option for long puzzles. It also has a very useful option that allows you to save nine locations in the maze so that you can automatically return to those spots at will. You aren't just teleported there, but escorted through the corridors in a moving panorama.

Wayout is a very interesting game that proves to be more frustrating than challenging. In some ways it appears to be not so much a game as a graphics tour-de-force in search of a game. I think beginners will find it extremely irritating to play. At least some of the easier mazes should have the option of eliminating the Cleptangle. I shouldn't, however, leave readers with the impression that *Wayout* is just a so-so game with great graphics. It is a puzzle game and although it has the fluid motion of an arcade game and an enemy to thwart your every turn, there are no thrills. Instead, it requires an extraordinary amount of patience and perseverance.



WAYOUT



THE SNAPPER

THE SNAPPER

Company: Silicon Valley Systems

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$29.99

Availability: 4

Disk or Tape: Disk

OVERALL RATING	C+	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	B	CHALLENGE	B	HOLDS INTEREST?	B-
GAME DEPTH	C+	GRAPHICS	C	VALUE FOR MONEY	C

A number of twists make *Snapper* a unique eat-the-dots maze game. A haphazard grid of connected lines forms the playing field. Blots appear at various places on the grid. As each of the two different color blots are collected the remaining blots increase in value. The object is to collect as many of the blots as possible before either the timer runs out or you reach one of four diamond-shaped bases. Hitting a base ends the round. In addition a ring sometimes appears briefly in the very center of the grid. If you touch it, it awards you a bonus multiplier on the score for that round and repairs any damage to the grid.

The *Snapper* has two enemies in this game. The Whirlers devour pieces of the maze and make it harder to reach some of the blots. They also are deadly to the touch. You can use your shield one time each round to sneak past them. Shields accumulate if they aren't used. The Gamma-Field is a deadly series of rotating lines that move about the grid like Slinkies. They too are deadly to the touch.

The game requires a lot of strategy. The best approach is always to gamble that you will reach the next blot for ever higher points, rather than to return to base where you actually are awarded the accumulated points. As you progress during the game, some of the grid lines become colored slicks. You move at double speed on one, but you must reach the other end before you can turn. Your strategy must become ever subtler as more and more of the grid turns to slick. Also, sometimes you can't return to base before you obtain a certain number of blots.

The game is definitely much more interesting than most maze games. You aren't really pursued in this game, but nonetheless you must be careful. Once the Whirlers begin eating sections of the grid, it becomes much harder to maneuver on it. You can be trapped if you aren't careful. Control is adequate with a joystick, but sometimes response is slow, causing you to miss a crucial turn. The graphics are adequate, and the game has enough depth and strategic play to moderately hold one's interest.

OIL'S WELL

Company: Sierra On-Line Systems

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING	B	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B-	SKILL INVOLVED	B-	DOCUMENTATION	C
CREATIVITY	B-	CHALLENGE	B	HOLOS INTEREST?	B
GAME DEPTH	C-	GRAPHICS	C	VALUE FOR MONEY	C

Oil's Well provides an interesting and addicting variation of an eat-the-dots maze game. Using a joystick, you control a drilling rig on top of a maze of passageways containing droplets of oil. The oil pipe, equipped with a drill bit resembling teeth, extends from the platform like a long snake as you guide it deeper and deeper into the maze. Pressing the joystick button retracts the drill partially or completely. You need this retractibility to counter pipe-eating Oozies that wander the corridors. You can eat an Oozie by attacking it head on, but if one approaches your pipe from the side, you must retract it before the Oozie touches it. The game thus becomes one of cat-and-mouse, with you trying to reach the deepest oil reserves without letting an Oozie attack your pipe. One vitamin pill, buried deep in the maze, will temporarily slow down the Oozies if you can reach it. You also need to watch out for occasional bombs. Once you successfully mine all the oil, you advance to a faster level.

Despite the simplicity, lack of depth, and mediocre graphics, I found the game fascinating to play. You compete against the Oozies in drilling for oil and must be quick to survive. It seems all your fault if you lose, and if you only play again, you can win. It becomes addictive.

PAC-MAN

Company: Atari

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$44.95

Availability: 10

Disk or Tape: Cartridge

OVERALL RATING	A	CONTROLLABILITY	B+	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	B	DOCUMENTATION	A-
CREATIVITY	B	CHALLENGE	B	HOLDS INTEREST?	A-
GAME DEPTH	B	GRAPHICS	B	VALUE FOR MONEY	B+

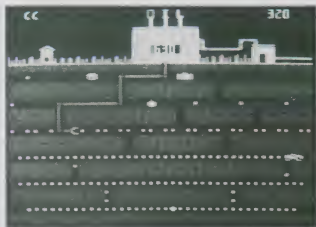
Pac-Man is the "official" version of the popular arcade game that has captured the American public's fancy over these past two summers. As in the arcade version, you play the yellow Pac-Man who gobbles dots as he navigates through the corridors of a ghost infested maze. Those lovable ghosts — Blinky, Pinky, Inky, and Clyde — each in their own inimitable way, pursue Pac-Man in a wild and merry chase. Pac-Man's only defenses are the four pills in the corners of the maze. Upon gobbling one of these, your Pac-Man becomes invincible for a few precious seconds, and allows you to hunt down your pursuers.

At first glance the maze looks different. But relax, the maze has only been stretched a little horizontally to fill the home screen's wider format. Rather than turn the maze on its side, as other copiers of the game have done, Atari kept it intact with the tunnels correctly on the sides. In fact, the game sounds and plays almost like the arcade version minus the cartoons. The game plays the Pac-Man theme music at the start, and those distinctive Pac-Man arcade sounds are identical.

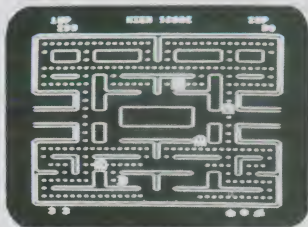
This version allows one player, or two alternating players to start the game on upper levels. Beginners can start on the slow cherry level, while seasoned veterans can start on the fast-paced key levels. The relative speeds between Pac-Man and the ghosts vary with each level. Pac-Man is much faster than the ghosts on the cherry level, about even on the strawberry level, and slower on the bell and key levels. The bonus fruits that appear beneath the ghost's pen remain for a short time, and are worth the same number of points as in the original game.

Joystick control is a little sluggish on the first two levels, but becomes satisfactory on the upper levels. The ghost patterns, which many have learned after playing the arcade version repeatedly, are unfortunately not the same in the home computer version. The characters, however, do take on the same personalities as their counterparts in the arcade. Blinky follows you closely, while Pinky, who is the fastest, always tries to cut you off. And bashful Inky will suddenly reverse direction in the midst of following you.

Overall, this is the best rendition of the game I know. Some players will be disappointed that the cartoons were omitted, but this was due to the lack of space in the 8K cartridge.



OIL'S WELL



PAC MAN

DIGGERBONK

Company: Educational Software

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING C-
GAME CONCEPT D
CREATIVITY C-
GAME DEPTH C-

CONTROLLABILITY C
SKILL INVOLVED D
CHALLENGE C
GRAPHICS C-

ERROR HANDLING N/A
DOCUMENTATION C
HOLDS INTEREST? C-
VALUE FOR MONEY D+

Diggerbonk is a maze game that's unique in the sense that this maze, which represents the corridors of a Titan mineshaft, constantly scrolls. The object of the game is to clear out the mine's deadly creatures hoarding the valuable Titan ore by using your maneuverable mechanical Digger. Since the mine is constantly scrolling down the screen, you must quickly do your work while treading the correct passageways upward. A wrong turn could trap you, for the crossover path may have moved off the bottom of the screen if you aren't careful.

Capturing any of the creatures is worth points. Letting one escape off the bottom of the screen will cost you slightly more points than it was worth in capturing. The Orange Whirlers, Pulsing Greenies, and Twinklers can be safely approached, while several of the other creatures (like the Purple Gurple) can only be tackled if you have Bonker Power. This glowing power is obtained for a brief period by bonking a Pulsing Greenie. Bonking this creature is especially important after capturing an Orange Whirler, because your point score will count down rapidly until you touch it. The Twinkler isn't worth many points, but it does allow you to break through the first wall you touch. This can be important if you become trapped. Bombs should never be approached; they blow up at random. If you are near one, it's curtains.

Diggerbonk requires considerable strategy. It combines maze-solving abilities with creature dangers. It isn't a chase game, as few of the creatures move; and those that do don't move far. Only the order of collecting the creatures becomes important, and time is a factor. There is certainly a strong element of chance involved: the creatures are placed randomly, and the maze itself is randomly generated.

Control is the weak point of the game. It isn't easy moving your Digger about the moving maze without hitting something, and points are deducted for each collision. Although you can save up the ability to punch through walls after capturing Twinklers, you are bound to prematurely strike the wrong wall. Even bouncing off the wall repeatedly begins to get on your nerves after playing the game for a while. *Diggerbonk* has merit and offers a good challenge, but isn't finally an exciting or addicting game, nor will it fascinate you for a long time.

PATHFINDER

Company: Gebelli
Language: Assembly Language
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: \$34.95
Availability: 6
Disk or Tape: Disk

OVERALL RATING	C	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C-	DOCUMENTATION	C
CREATIVITY	C-	CHALLENGE	C-	HOLDS INTEREST?	C
GAME DEPTH	C	GRAPHICS	C+	VALUE FOR MONEY	C-

The object of *Pathfinder* is to rid an underground maze of canisters of radioactive waste. These canisters are strewn about everywhere, and can be absorbed on contact by the Pathfinder as he is guided around the maze by your joystick controller. The maze is large and scrolls smoothly as you move about. There are Nukes, Minelayers, and Phantoms out to destroy you. Of course, you are armed with a plasma gun that can be fired in any of eight directions, but these enemies flit all around the screen, making mischief as they go. The Minelayers aren't as deadly as the Nukes that pursue you, but they do make a mess by laying mines that block your path. If you hit one of their mines with your plasma gun, you start a fire that quickly spreads. Fortunately, there are nearby fire stations where you can fill your gun with fire retardant pellets. While these are great for putting out fires, they are useless against your enemies.

The scoring system is questionable. While there are a certain number of Nukes, Phantoms, and Minelayers worth several points, destroying anything else is also worth points. It is certainly easier to accumulate a million points by mindlessly shooting down walls, or setting large fires and putting them out, than by tracking down your enemies. Collecting the radioactive waste becomes almost secondary except to obtain more energy to keep up your destructive pursuit of points.

The game has nine play levels, each characterized by color changes, sound warnings, and sometimes changes in the structure of the maze itself. Upper levels have teleport chambers for moving rapidly from one side of the maze to the other.

It's very hard to classify this game as either good or bad. While on the one hand it appeared to be a superficial and repetitious game, many of the teens who played it enjoyed seeing half the maze on fire and then trying to put it out. Although this isn't what was intended, it sure racked up plenty of points. Five million points is a pretty poor showing in a game where the score indicator has room for 10 billion. In short, the game has some merit and may find an audience.

JEEPERS CREEPERS

Company: Quality Software
Language: Assembly Language
Hardware Requirements: 36K cassette; 32K disk.

Department: Entertainment
Sugg. Retail: \$29.95
Availability: 7
Disk or Tape: Both

OVERALL RATING	B	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	B-	DOCUMENTATION	C+
CREATIVITY	B+	CHALLENGE	B+	HOLDS INTEREST	B
GAME DEPTH	B+	GRAPHICS	B	VALUE FOR MONEY	B

Jeepers Creepers is an arcade chase game in which you attempt to fill in the rectangles in four different mazes while deadly wasps pursue you. As you guide your bug around the maze it draws a line. If you completely surround a rectangle, it fills in. Now, some of these rectangles (shown with a picture) contain bonuses, some a free jump, some a helpful beetle, a rare few a key or some other item. There are also one to three secret squares containing super beetles. Normal beetles are slow, able only to eat one wasp before vanishing at the top of the screen. For a limited period of time super beetles can eat many wasps before reverting to regular beetles. Wasps are always reappearing; but if you use wisely your ability to jump to a new random spot on the grid, and make use of the help of your beetle friends, you should be able to completely fill in all of the rectangles on the grid without losing one of your three men.

This chase game is extremely fun and intriguing to play. It is a simple game offering a lot of choices and good depth. It is a game that has some surprises (such as stubborn rectangles that refuse to fill unless another rectangle has been filled first), and ways to earn bonus lives. Each of the first three mazes differs widely in difficulty. They appear randomly. Whenever you get a maze a second or even third time (if you are that good), the wasps swarm more fiercely. The author recommends playing the game with "coast off," to obtain higher scores. Remaining still often confuses the pursuing spiders and so gets them off of your tail. If you ever expect to see the kill run maze, which appears after clearing two Brick Wall mazes, you will need to use this control mode. In sum, *Jeepers Creepers* is a super fun game with good graphics and sound effects. It is a game that will hold your interest in repeated play.

KID GRID

Company: Tronix Publishing, Inc.
Language: Assembly
Hardware Requirements: 16K

Department: Entertainment
Sugg. Retail: \$29.95
Availability: 4
Disk or Tape: Both

OVERALL RATING	C-	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C-	SKILL INVOLVED	C-	DOCUMENTATION	C
CREATIVITY	C-	CHALLENGE	C	HOLOS INTEREST	D+
GAME DEPTH	C-	GRAPHICS	C-	VALUE FOR MONEY	D+

Kid Grid is an arcade-type game in which you attempt to fill in each of the 35 small squares in the rectangular grid. The square will automatically fill if you completely draw a line around its boundaries. It sounds simple, but there are four creatures chasing you around the grid. These creatures can't be killed, although they can be momentarily stunned if you are about to be cornered. You can choose 3, 5, or 7 stuns and five progressively faster levels of difficulty (on initialization only). Unfortunately, you can't change these parameters after one or more games without rebooting or reloading the games.

Kid Grid is a fun chase game that requires you to be on your toes to survive. However, the game's utter simplicity works against it after repeated play. There is only one maze and a simple strategy to keep one step ahead of the pursuing creatures. Although it is a good game, with nice graphics, there are similar games that are better.

TIME RUNNER

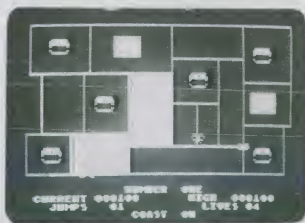
Company: Funsoft/JIG, Inc.
Language: Machine
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: \$29.95
Availability: 4
Disk or Tape: Disk

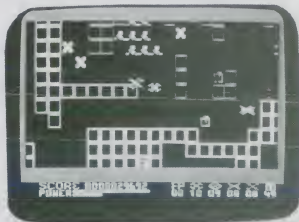
OVERALL RATING	C-	CONTROLLABILITY	B-	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C	DOCUMENTATION	D
CREATIVITY	C-	CHALLENGE	C	HOLOS INTEREST?	D+
GAME DEPTH	C-	GRAPHICS	C-	VALUE FOR MONEY	D+

In *Time Runner*, an arcade game based on the coin-operated *Amidar*, you fill in the dotted lines enclosing twenty rectangles on a grid while four defender droids chase you. When you have completed your task, you advance to the next level. Your score increases by the point value on the bonus timer. Even numbered levels have countdown point values for each block, but the value inside the rectangle falls rapidly once you have surrounded several sides. Unless you quickly finish the perimeter, you lose hundreds of points. You get three jumps that momentarily paralyze the droids, and you can even pass through them while they stand stunned.

The game suffers from its simplicity and lack of depth. The concept is overworked and becomes repetitive. Although not a bad game, it cannot match others with better graphics and more depth.



JEEPERS CREEPERS



PATHFINDER

LABYRINTH

Company: Broderbund Software

Language: Machine

Hardware Requirements: 32K (disk); 16K (cassette)

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Both

OVERALL RATING	B-	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	B+	SKILL INVOLVED	B	DOCUMENTATION	B
CREATIVITY	C+	CHALLENGE	B+	HOLDS INTEREST?	B-
GAME DEPTH	B-	GRAPHICS	C+	VALUE FOR MONEY	B-

Labyrinth is a difficult maze game in which the object is to rescue four imprisoned humans locked in boxes on each maze level. You are a blue, diamond-shaped figure, and you can move around the screen by joystick control. You are armed with a "trapper zapper" that can shoot in any of four directions. You will need to use this weapon frequently to kill the creatures that emerge from the horrors beneath the central box. These creatures patrol the dot-filled corridors and seek you out. Your trapper zapper has only three shots, and you must use them wisely to punch a hole through a wall or to kill a creature. If you can outgun a monster, you receive an extra shot. But beware, these monsters are quick on the draw, and they have an uncanny sense of when an intervening wall is about to open. Yes, these walls move, sometimes helping and sometimes hurting your quest. And if you manage to survive and free all four prisoners, the entrance to the next level is revealed.

The game's concept and graphics are fair. It's another type of eat-the-dots game, but with enough differences to make it a worthwhile addition to your game library.

CYCLOO

Company: Sirius Software

Language: Machine Language

Hardware Requirements: 48K, disk drive.

Department: Entertainment

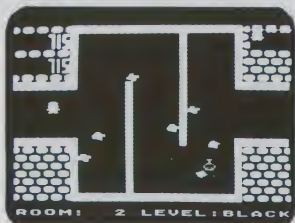
Sugg. Retail: \$29.95

Availability: 8

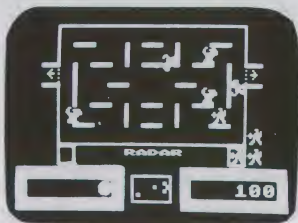
Disk or Tape: Disk*

OVERALL RATING	D	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B-	SKILL INVOLVED	C+	DOCUMENTATION	C
CREATIVITY	D	CHALLENGE	D	VALUE FOR MONEY	D
GAME DEPTH	D	GRAPHICS	C-	HOLDS INTEREST?	D

Cyclod pits an eyeball against a roomful of snakes. If this sounds interesting, read on. In each level of the game, seven snakes randomly meander about a maze while seeking to destroy a solitary eye. Fortunately they don't all appear at once, and you can use any of the maze's red bricks as weapons to crush the snakes. Some of the maze walls are stationary, while others, consisting of red bricks, can be moved by pushing the eyeball against them with the joystick. Once you have killed all seven snakes, you advance to the next level of difficulty where more snakes inhabit the maze. Skilled players can even start at a much harder level if they choose. The game ends when all three eyeballs are lost. *Cyclod*, finally, is a rather uninspired, strategy-oriented game, and an Apple translation.



SHAMUS



WIZARD OF WOR

WIZARD OF WOR

Company: Roklan, Inc.

Language: Assembly Language

Hardware Requirements: 16K; disk drive.

Department: Entertainment

Sugg. Retail: \$39.95 disk/\$44.95 cart.

Availability: 8

Disk or Tape: Disk & Cartridge

OVERALL RATING **A-**
GAME CONCEPT **B**
CREATIVITY **B+**
GAME DEPTH **A-**

CONTROLLABILITY **A-**
SKILL INVOLVED **B**
CHALLENGE **A-**
GRAPHICS **B+**

ERROR HANDLING **N/A**
DOCUMENTATION **C+**
HOLDS INTEREST? **B+**
VALUE FOR MONEY **B+**

Roklan has done an outstanding job in recreating the arcade game *Wizard of Wor* for the Atari home computer. It has the look and feel of the original game, introducing only minor changes. Basically, it's a maze game in which one or two warriors challenge worlunks, and a wizard on each of 21 increasingly deadly levels. The player's warrior, controlled by joystick, hunts down the Burwor, a creature that patrols each dungeon level. As time passes, the Burwors move faster and are joined by fish-like Garwors and their dragon-like Thorwor allies. The latter two creatures are invisible unless they are within your line of sight. However, they do appear on a small radar display at the bottom of the screen. The Worluk appears after these creatures have been dispatched. He moves around quickly, attempting to kill your warrior and then escape. If you can destroy it before it escapes, the next dungeon is worth double points. Finally, the Wizard himself may appear. He teleports very quickly to random spots in the dungeon, staying around only long enough to hurl lightning bolts.

One or two players can participate. In the two-player mode, the warriors are supposed to act as allies. But warriors are worth 1,000 points, so occasionally intentional fatal "mistakes" are made, or outright feuds develop with the object of killing your partner. It will take cooperation, however, to advance to the upper levels. The Worlunks begin shooting back on level 2, and become increasingly dangerous the deeper you penetrate the maze. The fourth level is called the Arena, because of the open area in the center. All levels have a passageway at the end that leads from one side to the other. The passageway closes for seven seconds after anything passes through it.

The game's graphics and sound are excellent. It is an action-packed shoot-'em-up without a single dull moment, and is a game that will hold your interest for a very long time.

SHAMUS

Company: Synapse Software

Language: Machine

Hardware Requirements: 16K; disk drive or cassette player.

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 8

Disk or Tape: Both

OVERALL RATING **A**
GAME CONCEPT **B+**
CREATIVITY **B**
GAME DEPTH **B+**

CONTROLLABILITY **A**
SKILL INVOLVED **B**
CHALLENGE **A**
GRAPHICS **A**

ERROR HANDLING **N/A**
DOCUMENTATION **C+**
HOLDS INTEREST? **B+**
VALUE FOR MONEY **A**

Shamus is a Real-Time adventure game that combines the shoot-'em-up aspects of an arcade game with the puzzle-map qualities of an adventure. The object is to reach the very heart of the Shadow's lair and destroy him. This is accomplished by exploring the various colored levels of the lair.

There are four levels, each containing thirty-two rooms. The rooms (which are mappable) contain dangerous whirling drones, robo-droids, and snap-jumpers. These creatures must be defeated with your ion-shiv (vaporizer) before you can proceed to the next room. Some of these rooms also harbor mysterious and extra life bonuses; and in a few, a colored key will open more passages into the lair — if you find the corresponding lock.

You play the Shamus (slang for detective), and must have sharp reflexes to defeat the Shadow's henchmen. There is danger in every room, and a quick exit leads to another room filled with more shooting enemies, even if it is the room that you just rid of the last robo-droid. Linger too long and your nemesis, the Shadow, appears. One touch and you're dead; however, a quick shot will stun him long enough for you to escape.

As with most adventures, this game should be mapped as you explore the maze by joystick control. Each room is numbered. Since the game doesn't have a pause control and the action is nonstop, it is difficult to draw a map without a friend's help. Even with a map, unless you can read it during the brief lulls, it is best to either have a friend navigate, or develop a good memory.

The sound and graphics are very good. A variety of sounds alert you to danger, success, and failure. A combination of player missile and re-defined character set graphics are used throughout. The game concept itself is very viable, with the play becoming more difficult and rapid as you advance through the blue and green levels until the speed becomes insanely fast on the red level. I assume the game is possible to beat, although it's going to take considerable practice. *Shamus* is really more of an arcade shoot-'em-up than a true adventure game. If you have the skill this can be a fun game. If not, you'll never see much more than the first level.

PREPPIE II

Company: Atari, Inc.

Language: Assembly

Hardware Requirements: 32K disk; 16K cassette.

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 8

Disk or Tape: Both

OVERALL RATING **B**
GAME CONCEPT **B**
CREATIVITY **B**
GAME DEPTH **B+**

CONTROLLABILITY **B**
SKILL INVOLVED **B+**
CHALLENGE **B-**
GRAPHICS **B-**

ERROR HANDLING **N/A**
DOCUMENTATION **B**
HOLDINTEREST? **C+**
VALUE FOR MONEY **B**

Preppie II continues the adventures of Wadsworth Overcash. Wadsworth barely survived the Groundskeeper in *Preppie I*, and was finally released from his summer stay in the hospital where he recuperated in a full body cast. Pleasant surprises await him during the pledge hazing ritual of the Delta Skelter Omega fraternity. Practical jokes can go so far, but pitting him against his arch enemy in the mazes of a deserted warehouse? That isn't fair!

The object of the game is to move Wadsworth safely about each of three different mazes. He paints the floor pink as he moves. The top maze, connected by a doorway to the other two, is fairly straightforward with several revolving doors. These flip direction when touched, if there isn't a giant enemy frog on the other side. Oh yes, there are numerous radioactive frogs out to get Wadsworth. Fortunately, none appears in the middle level, but there you will find fast moving and familiar golf carts and lawnmowers. Wouldn't you know that the Groundskeeper would bring them with him? The vehicles approach from both sides, but there are enough gaps in the horizontal lanes to allow you to dodge. You do have one secret weapon against all enemies: the cloak button. Push it and you become momentarily invisible. You have only so many seconds of cloak time, so use them carefully. When you completely paint all three maze floors, you move on to a harder level (there are five in all).

Preppie II is a nice game with fair graphics and good sound. As a maze game it isn't too much different from the arcade game *Lady Bug*. The center maze resembles many highway crossing games with the added twist that you must paint the path as you go.

GETAWAY

Company: Atari Program Exchange

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Both

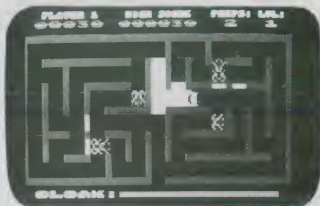
OVERALL RATING **B**
GAME CONCEPT **B**
CREATIVITY **B-**
GAME DEPTH **C**

CONTROLLABILITY **B**
SKILL INVOLVED **C**
CHALLENGE **B**
GRAPHICS **B**

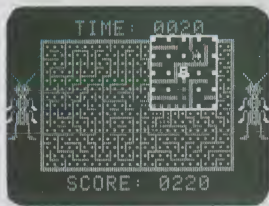
ERROR HANDLING **N/A**
DOCUMENTATION **C+**
HOLDINTEREST? **B**
VALUE FOR MONEY **B**

Getaway is a maze chase game in which a gang of thieves roams the town in an old beat-up car in search of loot. This thirty-five screen scrolling town is protected by four police cars which thrive on law and order. When the thieves leave their hideout, indicated by an H, they encounter bags of money left in the street. As they accumulate more and more loot, the cops become more interested in them. Unfortunately, their hideout is near the police station so it isn't prudent to chance taking a small sum of money back each time. Eventually, the thieves find the white armored van. Once they knock it off, the police really begin the chase. Hopefully, the escape car has a full tank of gas or it is going to be a short escape. Once the van's money and all three treasures have been picked up and returned to the hideout, the player advances to the next harder level.

The game's design is very solid. It is a balanced game on the easiest levels. The radar blips that appear in the corners help you to avoid the cops and track down the armored van. You must use your wits and driving skills to evade the fuzz. The game's graphics are very colorful and use a redesigned character set for the playfield. The car steers well in the mazes, and the game doesn't become tiring with extended play. *Getaway* is a good strategic action game that holds a player's interest.



PREPPIE II



TUMBLEBUGS

TUMBLEBUGS

Company: Datasoft

Language: Machine Language

Hardware Requirements: 24K, disk drive.

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 6

Disk or Tape: Disk*

OVERALL RATING

D+

GAME CONCEPT

C

CREATIVITY

C-

GAME DEPTH

C-

CONTROLLABILITY

B

SKILL INVOLVED

C

CHALLENGE

C

GRAPHICS

C+

ERROR HANDLING

N/A

DOCUMENTATION

C

VALUE FOR MONEY

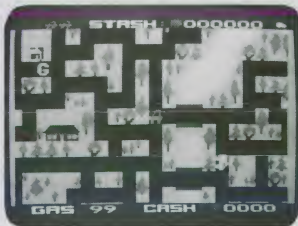
C-

HOLDS INTEREST?

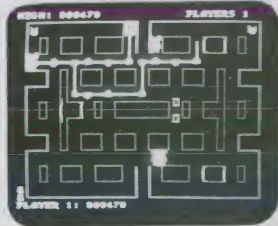
D

Tumblebugs, or *Dung Beetle* as it was originally called, is another maze game involving eating the dot-like tanna leaves. But this game is a little different with a rather unique graphics twist: the maze is about four times as detailed as the usual maze, and thus uses a magnifying glass in the section where your player is in order to enhance the small, detailed pathways. As your tumblebug consumes dots, it leaves a dung trail. The pursuing bugs (creepy-crawlers), which normally wander aimlessly, latch on to your scent upon encountering your trail. They immediately follow the trail, consuming it as they track you. The object is to eat all the dots, while avoiding getting killed. You only have one life.

The game can be played with either a joystick or a keyboard. While the controls are very responsive, the magnifying glass which is intended to help you also blocks the view of your pursuers who are often just beyond the edge of the lens. Thus there is a blind spot between the edge of the lens and the main map. When the enemy finally does get you, it audibly says, "I gotcha." *Tumblebugs* has its merits, but isn't a very exciting maze game, or much fun to play.



GETAWAY



MOUSEKATTACK

MOUSEKATTACK

Company: Sierra On-Line Systems

Language: Machine Language

Hardware Requirements: 32K, disk drive.

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 8

Disk or Tape: Disk*

OVERALL RATING	B	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B-	SKILL INVOLVED	B	DOCUMENTATION	C
CREATIVITY	B	CHALLENGE	B+	VALUE FOR MONEY	B-
GAME DEPTH	C+	GRAPHICS	B	HOLDS INTEREST?	B-

Dreaming up variations of the ever popular maze games has become a profitable endeavor for software authors. *Mousekattack* reverses the strategy of endless consumption. You play Larry Bain, ace plumber. Your job is to lay pipe in a rat infested maze where rats are bigger than your trusty cat. Cats will scare off the mice — well, most of them, except Super Rat. He has a big red S on his chest. He eats cats WHOLE. Then there are your two traps which can temporarily hold a rat until it gnaws its way through the mesh. If you're quick, you can beat it over the head with your pipe wrench. Of course, if a mouse gets you, you're a dead plumber. Fortunately, you have three plumbers on your staff.

The game can be played by either one or two players. The game's controls are rather simple. Pipe is laid by guiding your man around the maze with a joystick. The button allows you to pick up your cat and set it down wherever you like. The cat can be placed in a strategic position that will allow you refuge from those killer rats. Laying pipe is generally easy, except you sometimes make mistakes. You often need to double back to repair bad plumbing joints that leak, and some of these are very difficult to spot.

The game is not as simple as it sounds. Many will find that two players are a better match against rats of this size and ferocity, especially if you plan to complete the task and advance to the next level. In summary, *Mousekattack* is just an average maze game with a slightly different twist. In some ways it is harder than most games of its type, and one of the few cooperative arcade games. The graphics, music, and sound effects are very good.

JAWBREAKER II

Company: Sierra On-Line Systems

Language: Assembly

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 9

Disk or Tape: Disk

OVERALL RATING	C	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	C-
CREATIVITY	B	CHALLENGE	C	HOLDS INTEREST?	C
GAME DEPTH	C-	GRAPHICS	C+	VALUE FOR MONEY	C

Jawbreaker II is a completely revamped eat-the-dot arcade game. A chomping set of teeth is still loose in a candy factory, but the locale is no longer a maze. This time the candy shop features five parallel corridors with moving doors between them. Each corridor has a patrolling happy face that is out to pull your teeth. You have to be quick to gobble a few pieces of candy, then use either keyboard or joystick control to pass through those moving doors in order to avoid the grinning faces that are closing in on you. Four corner energizers allow you a few seconds in which to pursue and kill those faces. When you consume all the scattered candy, you advance to the next level.

The game is easier than the maze style eat-the-dots games. There are fewer dots, and the adversaries are more predictable. You must be careful to avoid the edges since an off-screen happy face might suddenly reappear. On the other hand, game play is more tense, since escape is a matter of timing rather than strategy. The four power dots are more than enough to help you clear the beginning levels. I can say the game is different, fun for awhile, but very shallow.

K-RAZY ANTICS

Company: CBS

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING **B -**
GAME CONCEPT **B**
CREATIVITY **B -**
GAME DEPTH **C**

CONTROLLABILITY **B**
SKILL INVOLVED **B -**
CHALLENGE **B**
GRAPHICS **C +**

ERROR HANDLING **N/A**
DOCUMENTATION **B**
HOLDS INTEREST? **C +**
VALUE FOR MONEY **C -**

K-Razy Antics is a very challenging and involved maze-type arcade game. There are six different mazes available for play. The object in this one-player game is to guide your white ant through a maze of tunnels in an anthill, while avoiding four hostile invading ants, the Anteater, and an occasional torrential rain flood. As you guide your ant through the tunnels, you must pick up enemy eggs to prevent their hatching, while simultaneously depositing your white eggs to insure the perpetuation of your species. The enemy ants are just as vulnerable to the flooding and Anteater as you are, but they can also be killed by picking up one of their eggs, luring them behind you, and dropping it so that it explodes and destroys any ants that have been following close behind. The Anteater who sticks his long tongue down the tunnels is dangerous. Hopefully he'll eat a few enemy ants. If all four ants are destroyed without having any enemy eggs remaining, you advance to the next harder level.

When the game begins, you have forty white eggs in reserve. They must be deposited sparingly, and in safe places where enemy ants won't eat them. They are not affected by flooding. Whenever you get killed, you must have at least one white egg remaining in the anthill for you to rehash. If you don't, the game ends.

The game is interesting and strategy oriented. The graphics are fair, yet a little crude when it rains, or the Anteater sticks out his tongue. Overall, *K-Razy Antics* is a fine game to hold your interest. This one offers a real challenge.

SERPENTINE

Company: Broderbund Software Inc.

Language: Assembly Language

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING **B +**
GAME CONCEPT **B**
CREATIVITY **B -**
GAME DEPTH **B**

CONTROLLABILITY **B**
SKILL INVOLVED **B**
CHALLENGE **B**
GRAPHICS **B**

ERROR HANDLING **N/A**
DOCUMENTATION **B -**
HOLDS INTEREST? **B +**
VALUE FOR MONEY **B**

Serpentine is an arcade game involving two rival teams of snakes pursuing each other in a closed maze. The object is to chase each other's tails, biting pieces off, until the enemy is smaller and can be attacked head-on. You control one snake at a time against three computer-controlled snakes that initially are larger than yours.

The first priority in a game like this is to eat the frogs that hippity hop around the maze. Every time you catch a frog, your blue snake grows larger by one length. Your snake begins three lengths long, while the enemy snakes are seven lengths long. When, and if, they become smaller by persistent tail attacks, they turn green and then can be attacked from the front. Tail sections aren't nutritious, and don't help you grow in length; however, attacking the snake head will increase your length by one. Snakes can never grow beyond seven lengths.

Once you have disposed of the three enemy snakes, more of the speckled eggs can hatch, and you advance to the next level. If any of your white eggs remain at the end of the level, they hatch and increase your reserve of warrior snakes.

The graphics are very good, and the game is well-conceived and fun to play. It has that arcade quality of nearly being an addictive pastime.

Flight Simulators

747 LANDING SIMULATOR

Company: APX/Atari Program Exchange

Language: Basic

Hardware Requirements: 24K cas, 32K disk

Department: Entertainment

Sugg. Retail: \$24.95

Availability: 6

Disk or Tape: Both

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

C-
B
C-
C

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

C-
B
A-
D

ERROR HANDLING
DOCUMENTATION
HOLDS INTEREST?
VALUE FOR MONEY

N/A
C-
D+
C-

In *747 Landing Simulator* you try to land a jet airliner on its runway approach from an altitude of 5,000 feet. Initially, the plane is 20 miles out and traveling at 600 mph. It must follow a 3 degree glide slope on its approach within close tolerances, or risk collision with a plane flying in another corridor. In addition to the pitch control, you must also take care to correct the heading so that it lands parallel and on the runway. The plane must touch down at an airspeed of 100 mph, and at a point not more than half way down the 10,000 foot long runway. Fuel and time are added constraints in a complex calculation that determines your final score. There are a number of difficulty levels (some include instrumentation), and the choice of flying with or without an automatic pilot.

The game is a very frustrating and difficult simulation. Since it is hard to keep the plane within the glide slope even on the beginner's level, a midair collision usually occurs within the first minute of play. The instructions suggest that beginners should fly the approach part of the way on auto-pilot. However, the auto-pilot does not keep the plane within the glide slope corridor, so a mid-air collision occurs immediately upon release of that mode. There is no way to avoid the oncoming plane except to get back within the glide as quickly as possible. The off-course indicator consists of a single arrow; however, this single arrow approach has a fault: when the plane's heading is off, the pitch heading arrows don't appear until the heading is correct again. This lack of information can be fatal if you stray vertically out of bounds at that crucial point.

The graphics are rather sparse. The runway is shown as three distant converging lines, and becomes larger as your plane approaches the runway. These move about the screen as the plane's pitch and heading change. A two line instrument panel next appears at the bottom of the screen containing all of the necessary information needed to land the plane. The aircraft is controlled by joystick, except for airspeed and brakes, which are controlled by the number keys. You can change its altitude by 50 ft/sec if the trigger button is up, and 3 ft/sec on the landing if the button is depressed.

While the simulation has many fine points and is realistic enough, it is much too difficult for beginners. There should have been a practice mode without crash planes. It is difficult enough to keep within the glide slope, and correct altitude errors before touching down without fearing that you will be terminated by a stray aircraft. Moreover, the error indicator should preferably have been "indicators," and should have included two arrows, or one with a cross hair. The program has its merits, but let the buyer beware.

SPACE SHUTTLE — MODULE ONE

Company: Swift Software

Language: Basic

Hardware Requirements: 32K; disk drive.

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 3

Disk or Tape: Disk

OVERALL RATING	D +	CONTROLLABILITY	C +	ERROR HANDLING	N/A
GAME CONCEPT	C +	SKILL INVOLVED	D	DOCUMENTATION	C -
CREATIVITY	C	CHALLENGE	C +	HOLDS INTEREST?	D
GAME DEPTH	C +	GRAPHICS	C +	VALUE FOR MONEY	D +

Space Shuttle Module 1 is a three part simulation of the launch, descent, and final runway approach of our newest space vehicle. The program allows you to choose between flying a complete mission, or flight training on any one of the mission's three parts. The player also keeps a flight log on a separate data disk.

Much of the simulation is, of course, controlled by on-board computers. For instance, computers automatically monitor and control the power level of the three engines. However, the pitch and roll of your craft during lift-off must be manually corrected. Depending on the level of difficulty, the craft either has to be nudged occasionally with your joystick control, or flown continuously.

The Attitude Direction Indicator (ADI) displays your present course as indicated by two moving bars that form a cross hair. They must remain centered, and centering them is difficult for beginners. The pitch axis presents no problem. When the bar is up, the nose is angled too low and you must pull back on the stick. It would seem logical to push the joystick in the opposite direction to correct the pitch, but the roll axis is different. When the bar is to the left of center, you have drifted to the right. This requires correction by pushing the joystick to the left. Beginners will often mistakenly push the joystick the wrong way and terminate the mission.

The screen views the cockpit during launch and final approach. Since there is little but sky to see at launchtime, the CRT display shows an exterior view of your ship while your main boosters and external fuel tanks are jettisoned. But at descent, the view shifts to the distant runway about 100 miles ahead. A chase plane is first to appear through the windows. Soon the runway appears and grows larger as the shuttle craft nears touchdown.

Control of the craft through descent from orbit is in the pitch axis only. This portion of the flight is presented in the form of a graph of the trajectory, and a blip indicating your current position. Control on the final approach goes back to two axes, and variations from nominal appear on the Attitude Direction Indicator. While control on the roll axis alters the horizontal position of the chase plane and runway as seen through the windows, changing pitch alters nothing. There is no overflying the runway or landing short. If your pitch or roll is not on target, the program terminates the mission. This is not realistic. Moreover, while the program does award points for accuracy, it should also allow the pilot to experience the consequences of straying off course. Shuttle simulators on other micro computers have these features.

While the graphics and cockpit display are well done, the actual flight simulation is much too automatic and unrealistic to seriously learn anything from it. The simulation is entirely mechanical for the player: you must keep on target or your mission is terminated. There is no allowance for experimentation to correct errors because the program does not calculate your in-flight position. The runway approach, while nice to look at, is a disappointment. It would have been relatively simple to have included pitch as a factor in the landing. Also, it is irksome to have to repeat the flight phase that you are practicing on during training by having to return to the main menu, and then reload the same program that you were just using.

Space Shuttle Module 1 is the first of a series of planned modules for the space shuttle. In the future look forward to being able to construct a space station, and fight the enemy with lasers against killer satellites.



SPACE SHUTTLE

JUMBO JET PILOT

Company: Thorn, EMI

Language: Machine Language

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$44.95

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING **D +**
GAME CONCEPT **C**
CREATIVITY **C -**
GAME DEPTH **C**

CONTROLLABILITY **D**
SKILL INVOLVED **C -**
CHALLENGE **C -**
GRAPHICS **C**

ERROR HANDLING **N/A**
DOCUMENTATION **C**
HOLDS INTEREST? **D**
VALUE FOR MONEY **D**

You can take your turn piloting a Jumbo Jet with this flight simulator. The object is to take off from your local airport, and fly your aircraft to another about 45 minutes flying time away. The plane's cockpit is equipped with a full set of flight instruments that show airspeed, heading, vertical climb rate, altitude, the status of landing gear, brakes and lights, and the position of elevator and rudder controls. There is also an artificial horizon indicator, and a map displaying the aircraft's current position that can be called up when needed. The narrow window at the top of the screen shows the ground moving below.

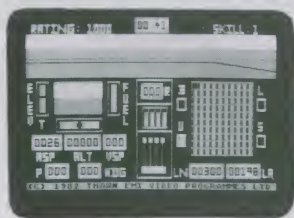
The first point to be made is that this aircraft is sluggish, and very difficult to control and land. While you expect a large jet to behave much differently from a small, single-engine aircraft, the response is so slow that you begin to overcompensate.

The jet initially begins at the airport's terminal building to be driven to the end of the runway before takeoff. The plane does not turn very quickly, but picks up speed the faster you go; therefore, you must throttle fairly high just to taxi, and brake often to slow down. Incidentally, the throttle key is right next to the landing gear key so if you aren't careful, the gear retracts and you crash on the ground. When you do get into position (you actually don't need a runway to take off), it takes nearly two minutes to accelerate to liftoff speed of 400 KPH. Even when you pull back on the joystick, the plane rises very slowly, taking several minutes just to gain several hundred feet. Strange as it may seem, it is possible to stall this craft if you climb too fast. When this happens, airspeed drops rapidly, even at full throttle with much less angle of attack.

Landing is near impossible, although I'm sure someone has managed it. Instructions say that you are to slowly throttle back from an altitude of 1,000 feet, and lower your airspeed to less than 100 MPH at touchdown. This plane doesn't have flaps or speed brakes to slow you down. It accelerates very rapidly on landing even with the engines off. I've tried to practice landing by first taking it up only 30 feet above the runway. Shutting the engine off does little for the first minute; the plane hardly slows down. By using elevator control you can eventually make the vertical climb rate negative. The yellow background, which indicates negative values, is very difficult to see, and you need moderate negative values to drop the 30 feet within several minutes. You can't try to zero it at the last moment because it takes nearly 30 seconds to respond. While I don't think values of -6 are excessive the plane does crash. Perhaps it is my high velocity that refuses to drop which causes the crash.

The graphics in the game are nice. There is a three-dimensional view of the ground represented by a grid. Everything becomes smaller as you gain altitude, and remains in true perspective. The runway is detailed, but often difficult to distinguish.

Again, the plane is sluggish and difficult to fly. The controls, on the other hand, are fairly easy to work with. The joystick controls both the rudder and elevators. Five keys control the various other functions like brakes, engine throttle, and landing gear. You have an option for night flight if you prefer to fly by instruments alone. Landing could be even more of a challenge with limited landing lights. Each game should last, barring crashes, for 45 minutes. The game is a little boring during midflight, but you could call the stewardess for cake and coffee. *Jumbo Jet Simulator* is a nice attempt, but try it out once in the store before you buy it.



JUMBO JET PILOT

FINAL FLIGHT

Company: MMG Micro Software

Language: Machine

Hardware Requirements: 24K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 5

Disk or Tape: Disk

OVERALL RATING

C-

GAME CONCEPT

C

CREATIVITY

D

GAME DEPTH

D+

CONTROLLABILITY

C-

SKILL INVOLVED

C

CHALLENGE

C-

GRAPHICS

D

ERROR HANDLING

N/A

DOCUMENTATION

C

HOLDS INTEREST?

D+

VALUE FOR MONEY

D+

Final Flight is a flight landing simulator that imitates the approach of a small private plane to a suburban airport. The pilot controls the plane by joystick and keyboard, and has a choice of navigating by visual approach, instruments only, or both. The latter is the easiest mode, and the one most players will choose. On approach you view the horizon and a small line outlining the runway at a distance. As the plane approaches the airport, the runway grows larger and the perspective changes. Since there are no visual indicators other than the two runway boundaries, it is difficult to judge altitude or the amount of runway left if you are flying without instruments.

The instrument panel is a strip of readings at the bottom of the screen showing distance to the runway, altitude, engine power, plane velocity, pitch, vertical airspeed, and fuel left. There is also a flight path indicator to warn you if the plane is above, below, or on the correct flight path for landing. Other indicators provide the status of the flaps, engine, and brakes.

The simulation has a number of levels of difficulty. For instance, the novice level disables side to side movement. The only hazard a pilot will encounter is the control tower, and only if he insists on approaching the airport low and short. Descending along the flight path is never a problem. More difficult levels begin with the runway off to one side, equip you with less fuel, and confront you with obstacles such as other aircraft. Players can also choose to fly in the fog, in which case the runway can only be seen when your plane is low and close enough to see it. (There are no hazards in this option.) Upon landing, brakes need to be applied, engine pitch reversed, and the flaps lowered or the plane will run off the end of the runway.

The plane is very responsive to joystick control to the point of being oversensitive. It is very easy to pitch the plane into a dive or stall it so that beginners should rely heavily on their instruments to avoid these pitfalls. If they use this approach they will find the plane very easy to land.

Final Flight is in machine language and looks like a much improved version of the *747 Landing Simulator* from APX. However, unlike a true flight simulator in which you can take off, fly around, and then land, this program only offers the landing phase. The graphics are minimal. In conclusion, the simulator has merit, flies much like a real aircraft, but after you master the rudiments of proper landings, it becomes tiresome.

Climbing & Jumping Games

DONKEY KONG

Company: Atari, Inc.

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$49.95

Availability: 10

Disk or Tape: Cartridge

OVERALL RATING	A+	CONTROLLABILITY	A	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	A-	DOCUMENTATION	B
CREATIVITY	A+	CHALLENGE	A	HOLDS INTEREST?	A
GAME DEPTH	A	GRAPHICS	A+	VALUE FOR MONEY	A

The heroics Mario performs to rescue his girlfriend from the clutches of Donkey Kong, who holds her captive atop a mass of broken girders, has become one of the most popular games in arcade history. I'm glad to report that the Atari 400/800 computer game cartridge duplicates the arcade game in all four screens, and is the best home version to date.

Mario uses his girlfriend's rescue at the bottom of a stack of inclined girders from a construction project. Some of these girders are connected by ladders. Donkey Kong, a large, sinister looking ape attempts to stop Mario from climbing up to rescue his girlfriend by rolling barrels down the ramps. Mario has to either jump over them, or break them with a hammer as they approach. The preferred method is to ignore the hammer and proceed as quickly as possible toward the top, for bonus points dwindle rapidly with time.

Mario moves in the direction of the joystick; to make him jump you press the button. He must be careful of falling barrels that sometimes take shortcuts down the ladders. Barrels that reach the bottom are ignited by a burning canister, and these roaming fireballs plague Mario if he doesn't proceed quickly to the top. Mastering this level of the game is a matter of timing and dexterity.

Mario proceeds to the second screen consisting of a pyramid of girders. His goal is to dash over the eight steel rivets that hold the structure together, while being careful to avoid the gaps and the pursuing firefoxes. It isn't a difficult screen, and only requires learning the pattern to reach all eight rivets without getting torched. The hammer next to the top level helps kill several firefoxes if you are cornered, but it isn't necessary to reach all the rivets and bonus prizes dropped by the girlfriend who remains prisoner at the very top.

The third screen is perhaps the toughest. It consists of a series of platforms connected by ladders and separated by two fast-moving elevators. Several firefoxes guard the platforms and make jumping hazardous at best. Donkey Kong compounds the problem by throwing bouncing, spring-loaded girders from the very top. It requires careful timing to jump over this never ending series of falling girders. The trajectory varies slightly from the original game, and the girders fall in three offset but predictable places. Again, this level requires much more skill and dexterity than the other screens.

The last screen consists of a complicated series of conveyor belts. Similar to the second screen with ladders interconnecting the various belts, firefoxes pursue you as you leap over moving sand piles on the conveyor belt. The object, of course, is to reach the girl at the top.

The graphics and sound effects in *Donkey Kong* are outstanding. When Donkey Kong pounds his feet the booming echoes through the girders. All of the characters are detailed, multicolored, and well animated. The firefoxes flicker like fire, and the barrels look like they are rolling. There are several differences from the original due to screen dimensions. The arcade game's screen is vertical rather than horizontal. Therefore, a ramp is missing on screen one of this version. Kong stands on the far right. To prevent a "squeezed" look on screen two, designers resorted to placing the girl on the same level as Kong. When Mario approaches her at the top, she is instantly moved to the opposite side. The other two screens are virtually identical to the arcade version.

The game can be played by either one player or two players alternating turns. You can start at different levels, but each of these starting levels begins with the first screen, thereafter shifting to the appropriate level. Each player begins with three lives and earns an extra life after 7000 points. Overall, *Donkey Kong* is a masterpiece in arcade translations. It is the first version to be as good as the original.

MINER 2049er

Company: Big Five Software

Language: Assembly

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$49.95

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING	A	CONTROLLABILITY	A	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	A-	DOCUMENTATION	B+
CREATIVITY	A	CHALLENGE	A	HOLDS INTEREST?	A+
GAME DEPTH	A+	GRAPHICS	A	VALUE FOR MONEY	A

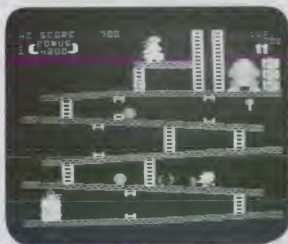
Miner 2049er is a ten screen arcade game in which the object is to claim or capture each mine station in a mine inhabited by mutant organisms. In some ways the game is similar to *Donkey Kong* in that the player, Bounty Bob, climbs and jumps about on a building framework. But the game is certainly no copy and, in fact, is much more involved since each mine station has a different set of hazards and requires a different technique to be victorious.

As your player moves about the mine station, the framework beneath his feet turns a solid color. To claim a station and advance to the next, you must fill in every section of the framework. The framework is often connected by ladders, and Bounty Bob can leap across sections at the same elevation. However, if you fall too far by miscalculating a jump, it can mean instant death. Deadly mutants also roam the framework, but you can dispose of them if you collect any of the tools left behind by the previous explorer. The mutants, who turn green for a few seconds, are then vulnerable. In addition, most of the mine stations have a hazard, like the radioactive pool on level six and the pulverizers on level nine.

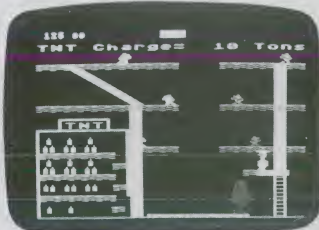
Miner 2049er is a race against time. A timer constantly ticks down while you try to fill the floor on each section of the framework. If it runs out, you die; but if you're successful, the remaining time is awarded as a bonus.

The entire game "feels" cohesive because it has a consistent design scheme, rather than a conglomeration of separate ideas for each level. Each of the stations is consistently harder. The first two or three levels are sufficiently easy for beginners to complete, and only slides complicate the matter. The upper levels, on the other hand, require dexterity and timing; some have moving platforms or elevators that you must leap upon at precisely the right moment; and the order that tools are collected and mutants killed can mean the difference in completing a level. One level has an elevator to assist you, while another uses a cannon to propel Bounty Bob to the proper platform. If you load in too much TNT, it's "Good-bye, Bounty Bob!"

The game's colorful player-missile graphics are very good. The sound effects are minimal. Single joystick control is very responsive. Overall, *Miner 2049er* has impressive depth and challenge. Either one player or two players alternating turns can tackle this game. If a player manages to complete all ten levels he must repeat them at a faster rate of speed for even more bonus points. This game is a definite winner and should offer arcade fans hundreds of hours of enjoyment. Definitely recommended.



DONKEY KONG



MINER 2049er

JUMPMAN

Company: EPYX/Automated Simulations

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Supp. Retail: \$39.95

Availability: 9

Disk or Tape: Disk

OVERALL RATING	A	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	A-	DOCUMENTATION	B
CREATIVITY	A	CHALLENGE	A	HOLDS INTEREST?	A
GAME DEPTH	A+	GRAPHICS	B	VALUE FOR MONEY	A

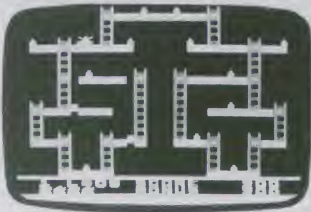
Jumpman is a thirty-screen arcade game in which the object is to defuse bombs that have been planted in the buildings of Jupiter Headquarters. You play Jupiter Jumpman, who has seven lives (just two short of a cat's) and the outstanding ability to leap between widely spaced girders. One misstep, whether an ill-timed leap or an encounter with a trap, robot, or dropped girder, means instant death in your bomb disposal quest.

The game, which can be played by one to four players, is joystick-controlled. Jumpman moves left or right, and climbs ladders or ropes with simple left, right, up and down movements. Leaps are made in the desired direction by pointing the stick in the proper direction and pressing the trigger. He jumps further if he has a running start. His speed (which defaults to medium) can be changed at any time during the game.

The game offers considerable depth of play. Each of the thirty levels provides a unique challenge. The beginning levels are very predictable: certain robot-like monsters chase after you as you collect the bombs. Some of the girders are connected by ladders, while others use ropes. Sometimes bullets are shot at you from the edges of the screen; and on one level two gunfighters are tracking you down. One level features a dragon that you have to spear to kill. And one level ends in a merry chase after those last few bombs that continually move about the screen as you clamber up and down the ladders in pursuit. Upper levels tend to be much more puzzle-like. Usually there is something still chasing you, but the order in which you defuse the bombs can prove to be very important. Touching one will often remove an important ladder or girder, making another bomb unreachable. One level even appears to be completely blank, becoming visible as Jumpman moves around. You sometimes have to leap into the unknown, gambling throughout that a girder will appear on the other side. Fortunately, when you make a mistake on any level, you don't have to start that level over. Only the bombs you haven't collected reappear.

There are five games on the disk. The beginner's game has eight easy levels (1-8), the intermediate has ten (9-18), and the advanced has twelve (19-30). The Grand Loop has all thirty levels, while the Randomizer allows you to play a random selection (but always starting with Robots II). Each play level is timed, so if you finish the level quickly you receive a bonus score added to the points collected for dropping bombs and killing creatures. In the multiplayer games, each player plays until completing a level or losing all men. Then the joystick is passed to the next player, who tries his hand on the same level.

Jumpman is much like several of the other "jumping" games (e.g., *Miner 2049er* or *Candy Factory*). Although *Jumpman* is less polished, it offers considerably more levels or depth than its competitors. It is a very playable game relying on the curiosity factor to entice you into playing the game all night. Control is good, although you can occasionally get stuck on a ladder in a tense situation. Jumping to safety usually corrects the problem. The graphics and sound are little better than average. *Jumpman* is a very good game that will certainly hold your interest for a long time.



JUMPMAN



CRISIS MOUNTAIN

JUMPMAN JUNIOR

Company: EPYX/Automated Simulations

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$40.00

Availability: 6

Disk or Tape: Cartridge

OVERALL RATING	B+	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	A-	DOCUMENTATION	B
CREATIVITY	A	CHALLENGE	A-	HOLDS INTEREST?	A-
GAME DEPTH	B	GRAPHICS	B	VALUE FOR MONEY	B+

Jumpman Junior, a smaller cartridge version of *Jumpman*, has twelve brand new levels. You guide your man up and down ladders and ropes and over platforms to defuse bombs planted in Jupiter Headquarters. Your joystick-guided character can leap great distances through the different levels. Electrocuting traps on the second level impede your progress while enemy bullets track you. Other levels feature hazards like hurricane winds, moving walls, and hailstones. One level contains objects that remain invisible until you touch them. Like its predecessor, *Jumping Junior* holds your interest.

CRISIS MOUNTAIN

Company: Synergistic Software

Language: Assembly

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING	B+	CONTROLLABILITY	A-	ERROR HANDLING	N/A
GAME CONCEPT	B+	SKILL INVOLVED	B-	DOCUMENTATION	B
CREATIVITY	A-	CHALLENGE	C+	HOLDS INTEREST?	B+
GAME DEPTH	B	GRAPHICS	B+	VALUE FOR MONEY	B+

Crisis Mountain is a fascinating, entertaining, and original arcade game that takes place in the caves and tunnels beneath a periodically active volcano. It seems that a group of terrorists, in their hurry to evacuate the cave, left behind their weapons, tools, and several nuclear devices. You must defuse these bombs before they explode and cause a full scale eruption.

The view is a cross section of the caverns where two volcanic vents bubble molten lava. Boulders (some large, some small) spew to the very top of the cave. From here, they roll or bounce down to seek their lowest potential energy. Should a boulder head toward a player, he must jump to avoid it, using a joystick controller à la *Donkey Kong*.

The player begins with three men, each of whom has a strength rating of three. If a boulder hits him, his strength drops one point so that he can no longer run but walk, and if hit again, only crawl. Time heals, so he soon is mobile again. If he is hit too many times in a row, he dies.

To reach many of the bombs and bonus objects in the cave, the player must often leap across the lava pits or crawl through narrow passageways. This takes some dexterity and practice. While it is best to be careful and wary throughout, time is of the essence. Retrieval of the shovel will speed up your digging, but it is randomly placed, often at sites difficult to reach; and, if you are struck by a rock, it drops to a new location in the cave. To dig, the player must drop to his knees and dig quickly through the surface to the bomb. A counter shows the amount of time left on each detonator.

When a level is completely cleared there is a bonus run. The time left on the bomb clock is added to your bonus time. You are free to collect treasures and supplies until you either run out of time, or are hit by a rock or by Bertram the Bat. When you have cleared all of the supplies, you enter the Nova round. Novas are worth extra points if you pass over one. Two more appear, then three. If you have at least one man left after this round, you go on to the next level and a new cavern.

The game is excellent, and a lot of fun to play. It is slow moving, but there is always enough going on to hold your interest. Enough randomness both in game setup and dangerous obstacles makes the game challenging. It is also fairly easy for a beginner. The graphics are nicely animated and will please spectators who are awaiting their turns. (Even those who fail are rewarded with an impressive sequence of the exploding volcano.) An average game takes fifteen minutes, so friends will have to buy their own computers to get much game time in. This arcade game ranks high on my list of must-haves.



LODERUNNER

Company: Broderbund

Language: Machine

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 9

Disk or Tape: Disk*

OVERALL RATING	A+	CONTROLLABILITY	A-	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	A	DOCUMENTATION	B+
CREATIVITY	A	CHALLENGE	A	HOLDS INTEREST?	A+
GAME DEPTH	A+	GRAPHICS	B	VALUE FOR MONEY	A

Loderunner is a challenging game with 150 different screens or levels. The game is one of those climbing, jumping, ladder and platform style games in which the object is to recover the gold scattered about in the various treasury rooms. Each treasury room is guarded by three or more bungling Empire guards who aren't very bright and can be easily trapped by your unarmed Intergalactic Commando.

The game is joystick or keyboard controlled. The commando can climb ladders, jump down from any height, walk across platforms, and travel hand-over-hand across the bars spanning high spaces. He is equipped with a laser drill pistol to drill passageways through fissured bricks in order to reach hidden gold in sealed chambers or jump between levels. These pits are also the only way to kill or trap a guard.

Each of the *Loderunner* levels presents a fresh challenge, but many require a bit of strategy to master. Some appear unsolvable even after playing them for a long time. They are all solvable but often they build on clues found in earlier levels. Although you can play any level by using the documented cheat keys, there is a certain progression to the game that begins on the first level. These cheat keys also let you play more men, but if you use the cheat keys, you can't save your high score—a fair tradeoff.

With the inclusion of a screen editor to create your own levels, the author elevates a game with good depth to one with unlimited depth. This editor allows you to easily create storage disks with 120 different levels. It is the simplest game generator on the market. The cursor is moved about the screen with the I, J, K, and M keys. Choosing one of the number keys places floors, ladders, handbars, trap doors, gold chests, enemies, and the player anywhere you please. The O key erases mistakes. The Control-S key combo saves the board before you play-test it. Fine tuning each board for playability becomes the hardest part of the game design.

Loderunner is a definite winner. Its graphics offer good animation and it has surprising depth. Strategy is emphasized over outright violence, and the game is to be won only through planning and strategy.

FAST EDDIE

Company: Sirius Software

Language: Machine

Hardware Requirements: 8K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 6

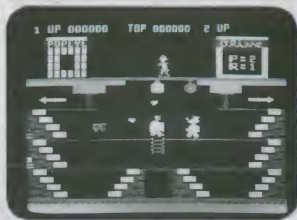
Disk or Tape: Cartridge

OVERALL RATING	D+	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	D	SKILL INVOLVED	C-	DOCUMENTATION	C
CREATIVITY	D+	CHALLENGE	C	HOLDS INTEREST?	D+
GAME DEPTH	C-	GRAPHICS	D+	VALUE FOR MONEY	D

Fast Eddie is a direct conversion of a 4K Atari VCS cartridge. It is a simple ladder climbing game with minimal depth of play. The object is to score points by touching floating hearts, fish, and other objects as they appear on each of the four ladder-connected levels on the screen. Little creatures borrowed from the game *Sneakers* guard the levels. Some constantly move around while others remain stationary for longer periods of time. You can jump over these using the joystick button, but you must be careful not to touch any. When you have gathered enough objects, you advance to the next harder screen where the creatures move faster. Each of the levels is marked by a different set of objects, and more difficult levels can be selected from the start. The game's graphics are elementary, and there was no attempt to improve them during the translation. This, along with overall game concept, make for a weak game.



AZTEC CHALLENGE



POPEYE

AZTEC CHALLENGE

Company: Cosmi

Language: Machine

Hardware Requirements: 16K cassette, 32K disk

Department: Entertainment

Sugg. Retail: \$9.95 cassette / \$14.95 disk

Availability: 4

Disk or Tape: Both

OVERALL RATING **B**
 GAME CONCEPT **B**
 CREATIVITY **A-**
 GAME DEPTH **B+**

CONTROLLABILITY **B**
 SKILL INVOLVED **B**
 CHALLENGE **B+**
 GRAPHICS **B**

ERROR HANDLING **N/A**
 DOCUMENTATION **C**
 HOLDS INTEREST? **B+**
 VALUE FOR MONEY **A**

Aztec Challenge is an arcade game in which one or two players, attempting to escape their sentences of being sacrificed to the gods, compete in an obstacle course known as the "Aztec Challenge." The course consists of 99 obstacles spread over 7 successively harder skill levels. The height of the jump is controlled by positioning the joystick (up for a high jump, centered for a medium, and down for a low jump). You must jump over the various obstacles that scroll past by depressing the joystick button.

The first phase, consisting of platforms of different heights, is relatively easy. Level two is more difficult, with its barriers of different heights. It is important to keep your jumps low; otherwise you will soar right into the next barrier, or smack your head into the post directly above the barrier that you attempt to clear. Level three is a combination of the preceding two levels. But the real challenge begins on level four. Not only do you have to have perfect timing to leap from box to box and past very sharp spikes, but a miss lands you right in the fire pit below. These maneuvers require much practice. Fortunately, the game has a "Continue mode," which allows you to continue your game where you left off after you have expended your three players. At this point, however, the score starts over. In this manner, you can practice on the upper levels until you become proficient.

Two players can compete simultaneously, with the second player running just behind the first. While this method alleviates the long wait between player turns, it is somewhat frustrating with two players of unequal abilities. The game restarts on the same level after each player's demise. The one saving feature of the two player mode is that the death of one opponent sometimes saves the other who just made a fatal error, but hasn't yet collided with an obstacle.

This is a fun game and one you'll enjoy playing. The stick figure graphics and the strange collisions with obstacles are humorous. The game, with its fine horizontal scrolling, makes excellent use of the Atari's graphics. At its price, *Aztec Challenge* is an outstanding buy.

POPEYE

Company: Parker Brothers

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$34.95 Cartridge, \$44.95 Disk

Availability: 6

Disk or Tape: Both

OVERALL RATING	B+	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B+	SKILL INVOLVED	B	DOCUMENTATION	B
CREATIVITY	B	CHALLENGE	B+	HOLDS INTEREST?	B
GAME DEPTH	B	GRAPHICS	B+	VALUE FOR MONEY	B

Popeye of cartoon fame has become a video game cartridge, basically a faithful translation of the coin-operated game in which Popeye rescues his girlfriend, Olive Oyl. The game includes three scenes with similar play mechanics, each level having a series of platforms connected by staircases and ladders. Popeye must catch twenty-four hearts that Olive tosses down to him before they sink in the water at the bottom of the screen, and you control Popeye with a joystick. Popeye's arch enemy, Brutus, and an old Sea Hag complicate your task. Brutus tries to kill Popeye by jumping up and grabbing him, or punching him in the noggin. The Sea Hag throws bottles from the side. Popeye can break the bottles with his fist, but isn't strong enough to threaten Brutus unless he eats the can of spinach that appears randomly. After that, he can turn the tables and knock Brutus clear off the screen with one punch. Since only one can of spinach appears on each screen, Popeye also deals with Brutus by hitting the punching bag. If you time his hit just right, the bag falls down and knocks Brutus out temporarily.

In the second round the adversaries remain the same. Popeye must catch sixteen love notes. A see-saw helps him spring from one platform to another. A third round adds swooping vultures that Popeye can punch, and moving platforms that whisk him from side to side as he tries to catch eighteen "help" letters. Each time he catches one, the ladder grows another rung until it is complete. At this time the game begins again on the first screen at a faster pace.

I found the animated graphics with their clever animation and recognizable details very appealing. The play mechanics remain cartoonish in nature and theme, faithful to the comic strip in which Popeye battles Brutus for Olive Oyl's affection. The game requires dexterity and skill to master and holds your interest throughout.

FLOYD OF THE JUNGLE

Company: Microprose

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 9

Disk or Tape: Both

OVERALL RATING	B	CONTROLLABILITY	B-	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	B-	DOCUMENTATION	C
CREATIVITY	C+	CHALLENGE	B	HOLDS INTEREST?	C-
GAME DEPTH	B	GRAPHICS	B	VALUE FOR MONEY	B-

Floyd of the Jungle is a cute and enjoyable arcade-style game that requires considerable dexterity to win. The object of the game is to avoid the pitfalls of a multi-tiered jungle environment and rescue lovely Janice, who has been kidnapped. The jungle trails are beset by dangerous tigers, poisonous snakes, and vicious pygmy warriors who blow poisonous darts at the hero. The river is a raging torrent where dangerous alligators lurk, and the clearings are filled with elephants. Our hero, or three others who simultaneously compete, must negotiate the hazards with carefully timed leaps, climb vines connecting the various tiers, wrestle pygmies to the ground, and ride the backs of dangerous animals.

Each player controls his man with a joystick. The hero leaps or jumps by push-button control. He can move left and right as well as climb or descend vines. Timing is critical. Leap too soon and Floyd falls into the river, the undergrowth, or the jaws of a dangerous animal. Our hero isn't killed, but returned to the bottom of the screen where he begins once again.

CANYON CLIMBER

Company: Datasoft

Language: Machine

Hardware Requirements: 16K; disk drive or cassette.

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Both

OVERALL RATING	B -	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	C+
CREATIVITY	B -	CHALLENGE	C	HOLOS INTEREST?	C+
GAME DEPTH	B -	GRAPHICS	B	VALUE FOR MONEY	C+

Escaping from the bottom of a danger-filled Grand Canyon in the Wild West is the goal of *Canyon Climber*. You must overcome big-horned mountain goats, Indian archers, and eagle-eyed birds that drop bricks. It requires keen timing and skill to reach the top of this three level game.

On the first level of the ascent, the task is to lay dynamite charges under the support pillars of four towering bridges. Each bridge is connected by ladders, and a plunger to detonate the charges is located at the far right on the top span. Unpredictable, horned mountain goats patrol the spans in pairs. The only way past them is to leap over their sharp horns. Your timing has to be just right, or they will knock you down to the bottom of the gorge. Jumping over them is sometimes a matter of luck, since they will unexpectedly turn around just as you are about to push the button of your joystick.

The second level, which contains a long zig-zag ramp, is guarded by Indians armed with bows and arrows. You have a choice of using a shield, or just jumping the arrows. The shield, which looks safe, isn't. It has a nasty habit of disappearing just when you need it most. And jumping over the arrows requires careful timing and considerable practice.

Level three opens up to a wide sky above the mesa-like bluffs that you must scale. Athletic dexterity is needed here, as you leap from one mesa to the next across open gorges. One miss and you have lost another man. Meanwhile, danger lurks overhead as eagles continually drop bricks. You must remain on constant alert to dodge them should they venture too close. If you succeed in getting to the top of the canyon, a goat awaits to kick you back to the very bottom. This first fall to the bottom is very disconcerting; but after awhile, you shrug and decide it must be the programmer's method to keep the game going.

The game is supposed to be tougher on the second level. The goats are slightly faster and more unpredictable here, but the other two levels appear to remain the same in terms of difficulty. The graphics are good, although nothing out of the ordinary. The game, finally, is fun, and appeals to the climbing instinct in many of us.

APPLE PANIC

Company: Broderbund

Language: Machine

Hardware Requirements: 16K cassette, 48K disk.

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Both*

OVERALL RATING	B+	EASE OF USE	B -	ERROR HANDLING	N/A
GAME CONCEPT	B+	SKILL INVOLVED	C+	DOCUMENTATION	B
CREATIVITY	B	CHALLENGE	B+	HOLDS INTEREST	A
GAME DEPTH	B	GRAPHICS	C+	VALUE FOR MONEY	B

Apple Panic is an intriguing arcade game that is virtually identical to *Space Panic*. You are in a six story brick-floored building. The floors are interconnected by a maze of ladders. The object is to destroy the little apples that are chasing you by digging holes in the brick floors for them to fall into. Once an apple gets stuck in the hole, you have to knock it through the hole by beating it over the head. If you get to the apple too late, it may crawl out of the hole and get you.

Movement control is by joystick and is very responsive. The trigger button digs and fills the holes. The game strategy is very simple. Lure an apple into a hole by letting it chase you, fall through the hole to the next level without injury, then climb back up out of the hole in order to hit it over the head. Kill off all the apples and you advance to a harder level. The main difference from the original Apple version is that other apples can cross the hole to kill you while you are pounding the apple to death. A Green Butterfly, which proves difficult to kill, can appear on some of these harder levels. In one of these levels, you confront the Mask of Death, a real bummer. You have three lives but you can earn a bonus life. The game is clever and fun.

MR. ROBOT

Company: Datamost

Language: Machine

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 8

Disk or Tape: Disk*

OVERALL RATING

A

CONTROLLABILITY

B+

ERROR HANDLING

N/A

GAME CONCEPT

A

SKILL INVOLVED

B+

DOCUMENTATION

D

CREATIVITY

A-

CHALLENGE

A

HOLDS INTEREST?

A

GAME DEPTH

A

GRAPHICS

A

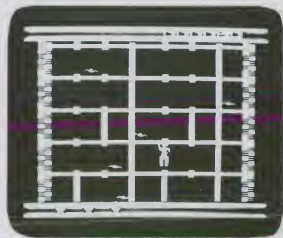
VALUE FOR MONEY

A

Twenty-two levels make up this jumping, climbing, arcade game. Although it resembles *Miner 2049er*, *Mr. Robot* offers more variety with its many escalators, conveyor belts, ladders, trampolines, teleporters, energizers, bombs to walk over and ignite, and magnets to help you jump further. You try to collect all the power pills on one level before moving on to the next. Your joystick-controlled robot moves from platform to platform using connecting ladders, escalators, and teleporters. He jumps when you press the joystick button. You must not let him fall too far, because if he falls more than one and a half times his own height, he dies. He also has limited energy for each level and must complete his task before he runs out. While doing so, he must avoid or destroy the alien fireballs that wander along the platforms and ladders. Only by touching an energizer and destroying the fireball before the invulnerability fades can you get rid of a fireball.

Each unique level requires planning and strategy to complete successfully. If you wish to design your own screens for the game, you need only use the outstanding *Robot Factory* construction set to create twenty-six different screens using a single joystick. All the possible parts appear at the bottom of the screen. By moving the cursor to the part and pressing the button to grab it, you can move the part to the desired location and press the button to set it there. Holding the button down forms a row of the parts, such as in building a ladder. You erase mistakes by picking up a black piece and moving over the unwanted areas. You are limited to one robot, four alien fireballs, and four transporters. Once you have completed the screen, you can test it. Be sure to hit Select when you finish the test, or you will lose your screen. You save screens to another disk under a letter label. You can later load a particular screen to reedit, or load them all in sequence from A to Z when you want to play the game.

Mr. Robot has excellent graphics. The game is challenging, fun, and diverse. When you add the *Robot Factory* construction kit, the game rises above all the other jumping, climbing games on the market. The creative individual will spend hours creating games for others and enjoy doing it almost more than playing the game.



APPLE PANIC



FLOYD OF THE JUNGLE

SQUISH 'EM

Company: Sirius Software

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 5

Disk or Tape: Cartridge

OVERALL RATING

D+

GAME CONCEPT

D

CREATIVITY

D

GAME DEPTH

D

CONTROLLABILITY

C

SKILL INVOLVED

D+

CHALLENGE

C-

GRAPHICS

D+

ERROR HANDLING

N/A

DOCUMENTATION

C

HOLDS INTEREST?

D+

VALUE FOR MONEY

D

Squish 'em, a lightweight arcade game, resembles *Crazy Climber*. Your character must climb the girders of a forty-eight story building to retrieve a suitcase. Various monsters and an unseen enemy drop boxes, making the climb perilous. You employ the firing button to lift your character's legs so that he can slide over them, or make him pause and drop his legs to squish 'em for points. Once your character touches the suitcase he faces the same task on a similar building.

Squish 'em lacks depth and cannot hold your attention for more than a short time, but I found it fun to play. Unfortunately, it looks very much like a VCS game that never got released, but instead was converted to the Atari computer system. It is so spartan, the graphics plain and sparse in detail, that even as you accumulate points you have no idea what floor you are on.

KANGAROO

Company: APX

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 5

Disk or Tape: Disk*

OVERALL RATING

B-

GAME CONCEPT

C+

CREATIVITY

B-

GAME DEPTH

B-

CONTROLLABILITY

C+

SKILL INVOLVED

C+

CHALLENGE

B-

GRAPHICS

B

ERROR HANDLING

N/A

DOCUMENTATION

C+

HOLDS INTEREST?

B

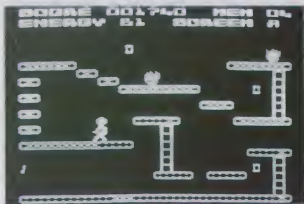
VALUE FOR MONEY

B

Kangaroo is a cute arcade game in which you control a mother kangaroo sporting a pair of boxing gloves. The object: to rescue your little Joey, being held captive by a tribe of monkeys in a treehouse atop a tall tree. Ladders connect the levels of the tree.

Rescue isn't that simple. The monkeys will try to knock you out of their tree by pelting you with apples. You can duck or jump to avoid the fruit, but the only solution is to move up the tree fast, get close, and land a solid punch to destroy them. Hop around and collect some of the bonus fruit to keep up your energy supply (ringing the bell produces more fruit). Dallying is not the answer if you're out for points because the bonus timer is worth more than that extra fruit. Each time you reach little Joey, you get the bonus points and progress to the next level.

There are four separate levels to the game. The first consists of flat, negotiable platforms connected by ladders. Subsequent playfields have stairs and gaps that must be traversed. The graphics are cute, well animated, and arcade quality. The kangaroo is realistic, the monkeys less so. The game itself is a good adaptation of a moderately popular game and fun to play. Children will especially enjoy this jumping, hopping, monkey business.



MR. ROBOT



KANGAROO

Arcade Style Games

ARCADE MACHINE

Company: Broderbund

Language: Assembly

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$44.95

Availability: 8

Disk or Tape: Disk*

OVERALL RATING

A

EASE OF USE

A

VENDOR SUPPORT

B

DOCUMENTATION

A

VISUAL APPEAL

A

ERROR HANDLING

A

RELIABILITY

A

USEFULNESS

B

VALUE FOR MONEY

A

Creating or customizing a fast-action arcade game lies beyond the programming capabilities of the average Atari owner. Even with the help of several texts on the subject, Assembly language programming skill, and the patience of Job, it is a formidable undertaking. Broderbund comes to the rescue with a new graphics package called *Arcade Machine*. This program generator designs a type of arcade game known as the shoot-'em-up. You can design and customize an old classic arcade game like *Galaxian*, or use your imagination to design something unique. Best of all, it offers valuable insight into how a game is designed by having you design one yourself.

Several factors make this outstanding program easy and fun to use. It is entirely menu driven, requires no programming ability, and displays results immediately. In addition, it offers considerable flexibility in letting you incorporate nearly all the features you may have seen in commercial shoot-'em-up games. Since designing a game requires attention to detail, the author has resorted to the tutorial approach, using a working game as an example. You are encouraged to modify a sample "space invasion" game. The nearly endless modification options begin with the altering of shapes. Shapes are organized into four groups called blocks, each of which consists of six small objects (8x7), three medium objects (10x10), or two large objects (15x12). You also get shapes for tanks (13x10) and explosions. The menu controls the sizes and types of shapes and displays these in a chart. You edit shapes on an enlarged grid. Each shape has four parts corresponding to the four animated frames for the object. The program cycles through the four frames as objects move horizontally, but not vertically. As each pixel is added to the grid, you have the choice of adding it to each of the other shapes as well (shown at the top of the screen). Other commands control color, transferring shapes to another frame, or shifting all the pixels left or right. In this way, you can adjust the four frames to obtain the desired animation effect, such as a man walking or a bird flapping its wings.

Perhaps the most enjoyable feature, the path creator, animates your shapes and lets you run the game option to watch the results. You can program ten different paths, each containing 254 instructions. This does not restrict the ten objects to ten paths, however. You assign each object to a particular path, but conditional jumps allow an object on one path to jump to the same position in the next higher numbered path. You program the paths on a screen with a keyboard-controlled crosshair. Each of the objects following a particular path has an initial starting position. You set these later, while choosing the level options. Two outer rectangles show screen boundaries, one relative to the other. Each move of the cursor programs the shape to move a set distance at a fixed rate of speed. You can vary both these parameters initially and during programming. You can also instruct shapes to drop a bomb in a particular direction when they reach a set point in their path, or transform to the next higher numbered shape when they reach that point. Additionally, a shape can remain stationary while objects perform up to thirty extra instructions, or they can make a conditional jump based on the position of the player's tank. Insert and delete commands let you edit the path. You can view commands in the path table individually, backwards, or forwards, with the use of the arrow keys.

You can set game variations with the game options. For instance, a game can be played with either one or two players (two player games cannot have both vertical and horizontal movement). You can also include a time limit, barriers on the bottom that erode when struck, bouncing bombs, random object bombing (an alternative to setting bomb drops while programming the path), and have the objects explode when they hit the bottom of the screen (useful in a game where you must catch falling objects). You can also change sound effects, customizing them for duration, pitch, and frequency. You select scoring point values for each type of object and for each level. Finally, you can position your object at its starting point in the path table. This is extremely important if you are designing a winding path where objects that start in different screen positions follow each other. If objects start their paths at different places in the path table for each level, the game (as you can imagine) will look substantially different on those levels.

You can easily create backgrounds in any of the four playfield color registers. The three drawing modes are plotting, line drawing, and rubber band line drawing. Commands allow circles, rectangles, and triangles. You can fill any empty area with color, or add large text lettering.

Once you have completely designed a game and created the background and title screens, you can save it to the data disk. You can save data for parts of a game at any time, but once an entire game is complete, you have the option of generating a bootable game disk that does not require the *Arcade Machine* program.

The documentation is clear and concise. The documentation explains each of the menu options, and a limited tutorial helps get the beginner started by reprogramming the sample game. Five other sample games (loaded from files on the reverse side of the disk) show the versatility of the program. The wondrous thing about this program is its ease of use and immediate feedback in viewing your creation. You can create programs piecemeal, or plan them carefully. They become immediately playable. You experience little frustration in designing a game, and although the program produces games of a set type, it is extremely versatile. Don't expect it to generate maze games, or even saleable games, but look forward to games that are different, fun to play, and uniquely your own.

Choosing Level Options from the Main Menu gives you some insight into this program's versatility. Several parameter charts are displayed for editing. One includes the values for star movement, speed, density, tank speed, movement limits and accuracy, missile speed, type, number, and drift, and bomb speed and type. You can adjust these for each of the five levels. Under Miscellaneous comes another option page that lets you choose items like smart bombs, steerable missiles, free tanks, and whether or not missiles should stop when they strike a background object or bounce off of objects drawn in Color 2 or 3.

GYPSY

Company: Avalon Hill

Language: Machine

Hardware Requirements: 32K (disk); 16K cassette)

Department: Entertainment

Sugg. Retail: \$26.00

Availability: 5

Disk or Tape: Both

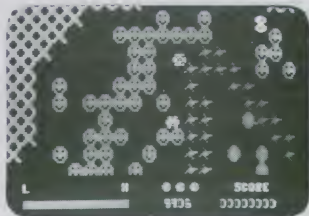
OVERALL RATING	F	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	D	SKILL INVOLVED	D-	DOCUMENTATION	C-
CREATIVITY	D	CHALLENGE	D-	HOLDS INTEREST?	F
GAME DEPTH	D	GRAPHICS	C-	VALUE FOR MONEY	F

Imagine playing the part of a gypsy moth whose sole object in life is to munch as many leaves on a tree as possible. Look no further for I have a dreadful game for you to play called *Gypsy*. Your joystick-controlled moth moves about on a large, multi-screen tree. Don't get any ideas that it scrolls; this is an "F" game. While consuming as many leaves as possible, you have to avoid the stings of ants and bees. You lose points for each bite, and you die if your score becomes negative. There are even a few mushrooms at the bottom of the screen that temporarily paralyze your moth on contact. Naturally, these too are to be avoided.

It is a mindless romp at nothingness. Anyone who manages to consume all the leaves on the tree deserves an award. The game has very mediocre graphics, terrible sound effects, and is boring as hell.



CLAIM JUMPER



ANDROMEDA

CLAIM JUMPER

Company: Synapse Software

Language: Assembly

Hardware Requirements: 16K; disk drive or cassette player.

Department: Entertainment

Sugg. Retail: \$44.95

Availability: 5

Disk or Tape: Both

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

B
B
C+
C

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

B
C+
C
B-

ERROR HANDLING
DOCUMENTATION
HOLDS INTEREST
VALUE FOR MONEY

N/A
B-
B+
B

Claim Jumper is a two player action game in which the object is to collect gold nuggets, trade them in for cash, and deposit that in the bank. It is a competitive game: while you are trying to accumulate wealth, your opponent is trying to steal your money before you reach the bank. He is armed with a pistol; but that isn't your only concern.

The strategy in the game would be rather simplistic if the game were simply a shooting match. But the addition of a number of snakes and tumbleweeds that chase cowboys of the opposite color (i.e., light colored snakes chase the dark cowboy, dark colored tumbleweed chase the light cowboy) make this game challenging. If a player is touched by these perils, he is paralyzed for several seconds, long enough for your opponent to steal the loot. If you successfully shoot at what is chasing you, it turns the opposite color and chases your opponent. And if you hit your opponent, he ends up temporarily in the hospital. You can only shoot while moving. If you shoot while stationary, you lay eggs or seeds. So if, for example, five tumbleweeds were pursuing the light colored cowboy and they were lured into hitting one of the eggs, it would turn into a snake.

The game is complicated, because there are a number of rules, more than most shoot-'em-up games have. But this added complexity is what makes the game unique and fun to play. There is a definite strategy to playing this game. What makes it fun is that simply to run to the bank is fraught with perils, and the money changes hands numerous times before one cowboy reaches the safety of the bank. The game can be handicapped for one player or the other if playing abilities are disparate; and there is an option that requires you to buy bullets from the general store, to add to the difficulty of the game.

The game's graphics are simple yet nice. Control, which is by joystick, is good. My only complaint lies with the scoring system. The game doesn't end when the first player accumulates 10 bills, but that does allow the player to buy a house worth 20,000 points. With a score requiring 25,000 points to win (1 house plus 50 conversions of snakes into tumbleweeds or vice versa), finishing a game is really anti-climatic.

There is also a one player version that is a simple shoot-'em-up, and so not much fun. The object is to destroy all snakes and tumbleweeds. In this game you must accumulate money in order to buy bullets. If you're touched three times, the game ends. Stick to the two-player game, which is very enjoyable.

ANDROMEDA

Company: Gebelli Software

Language: Machine

Hardware Requirements: 32K, disk drive.

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 4

Disk or Tape: Disk

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

D
C-
D+
C-

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

B
D
C-
C+

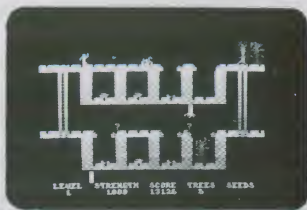
ERROR HANDLING
DOCUMENTATION
HOLDS INTEREST?
VALUE FOR MONEY

N/A
C
D-
D-

In *Andromeda* you play the part of a voracious renegade cell that has invaded an organism. You must continuously destroy fat and blood vessel cells in order to gain strength and keep moving. As you move around the scrolling field, various antibodies attempt to track you down and kill you. Every time you devour 5,000 points in cellular structure, you grow briefly in size, and can attack these pursuing antibodies.

Movement is by joystick. The button kills off the cells. Opposite to what you would expect, you will soon discover that travel is more slow through blood vessels. But since you need blood cells to prolong your own cell's life, the slow movement factor is a penalty. A gauge at the bottom of the screen indicates how much life you and the organism have left. When you kill the organism you advance to a harder level with more persistent antibodies.

There isn't much to this game. You simply travel around killing things off as quickly as possible. This gets tiring after awhile. This "improved" version is not a very good game, and if it weren't for the fine Atari style scrolling graphics, wouldn't be worth the price of a disk.



NECROMANCER



SALMON RUN

NECROMANCER

Company: Synapse Software

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: B

Disk or Tape: Both

OVERALL RATING	A-	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	A-	DOCUMENTATION	B
CREATIVITY	A	CHALLENGE	A-	HOLDS INTEREST?	B+
GAME DEPTH	A-	GRAPHICS	A-	VALUE FOR MONEY	B

Necromancer is a very unusual arcade game, different from anything on the market. You play the part of a sorcerer or Druid, and your task is to grow an army of trees in an enchanted forest, then march with those trees through spider infested vaults to finally confront the Necromancer in his foul lair.

The game is divided into three distinct parts. An army of trees must be planted, grown, and protected against prowling ogres. These ogres stomp down young trees while a deadly forest spider poisons adult trees and drains your Druid's strength if touched. Your Druid stands in the center and from him emanates a joystick-controlled Wisp. This magical Wisp has a store of seeds from which you can plant trees; it also kills ogres and spiders on contact. Hitting a dancing Eye Pod gives you an additional one or more seeds. Faces appear on the poisoned trees and they scream for help as they struggle to survive. The Wizard's strength ebbs with each kill, spider bite, or poisoned tree that has been cured until eventually Act One ends. The number of trees that survive determines your difficulty level and strength during the remainder of the game.

Strange and original music sets the mood in Act Two. There are five levels to the vaults, each containing eight spider larvae. Each vault is sealed, but the roots of your enchanted trees break through the concrete and smash the larvae as they fall into the open pit. Hitting them again at the base with your Wisp will return them to the tree bin. Meanwhile, your Druid can either move about by holding down the joystick button, or use his Wisp to animate the trees. As the Druid or the trees move about on the levels, Hands of Fate rhythmically descend from the ceiling lowering question mark (?) prizes. If you manage to get one, ladders may descend to the next level. Then again, the prize might even raise the ladders. If the Hands of Fate grab you, they will pull you screaming to the ceiling, minus some strength. If this happens to a tree, it is lost for good. The Hands of Fate move faster and faster in each of the lower levels. The frenzy of moving hands is so intense on the lowest levels that it is virtually impossible to reach the question mark prizes needed to lower the ladders. Here it is best to concentrate on killing all the remaining spider larvae before it's too late.

The Necromancer's Lair in Act Three is filled with gravestones upon which the Necromancer himself appears and disappears, leaving a little trail of flame behind as he goes. Killing the Necromancer with your Wisp gives you strength, but the Evil One soon reincarnates into another headstone. You can remove the gravestones by walking over them, but you must be careful not to touch him. Hopefully, you killed all of those spider larvae on your journey to the lair. If not, they reappear here as deadly Zombie Spiders. They appear at the end of the flames and suck your strength away until you either kill them or escape. If you kill them with your Wisp, the Necromancer can bring them back to life again and again. Finally, when you have removed all thirteen gravestones, the Evil One has nowhere to

go. You then advance a level and eventually, upon completing level five, win the game.

The animation in these acts is unparalleled; trees seem to be alive as they waddle around. Their anguished screams from the effects of the poison are lifelike, and the original music adds a great deal to the program. Act one has extremely fast action, but comes so repetitive that you wish to run out of strength in order to move on to the more interesting parts of the game. The second act is both interesting and difficult. It is possible to neglect the larvae and rush to the Lair; however, those fast moving Hands of Fate present a real challenge. I've yet to see Act Three, even with the help of several skilled players. *Necromancer* is a very unusual, challenging, and creative game. If there was ever a game that deserved the award for outright originality, this is it.

SALMON RUN

Company: APX/Atari Program Exchange

Language: Machine

Hardware Requirements: 16K cassette, 24K disk

Department: Entertainment

Sugg. Retail: \$22.95

Availability: 7

Disk or Tape: Both

OVERALL RATING	B -	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	C +
CREATIVITY	B	CHALLENGE	B -	HOLDS INTEREST?	C +
GAME DEPTH	C +	GRAPHICS	B -	VALUE FOR MONEY	B

Salmon Run is a cute little game in which the object is to guide a salmon to his upstream spawning ground. The vertical river course is treacherous. The shoreline is jagged, and the swift moving water has numerous waterfalls. Bears, seagulls, and young fishermen are deadly enemies to the salmon.

The entire river course scrolls downward as one to four players take turns guiding their fish to the spawning grounds. They race a shrinking horizontal line that represents the last moments of the fish's life. They accumulate points for swimming each foot of the river, and ten points for each waterfall successfully jumped. The fish will lose points for mistiming their leaps (activated by joystick), and striking the waterfall itself. If one reaches the headwaters of the river, the salmon mates and produces a baby salmon (worth an extra fish).

With bears and seagulls chasing your salmon, it sometimes pays to dive deep and hide. But you can't do this too long for that timer keeps ticking away the fish's life. You must be brave and guide your salmon slowly upstream, while being careful to avoid the children fishing, and those quick, hungry, black bears. The game becomes harder the longer you play. It can also be started on more difficult levels — these have more waterfalls and faster enemies.

The graphics and sound effects here are very good. In particular, sound effects simulate flowing water, hungry growling bears, and squawking sea gulls. Colorful, smooth scrolling add to the game's charm — an effective and enjoyable one, especially for the kids.

ANTEATER

Company: Romex

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$44.95

Availability: 3

Disk or Tape: Cartridge

OVERALL RATING	D	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	D +	SKILL INVOLVED	C -	DOCUMENTATION	C
CREATIVITY	D	CHALLENGE	C +	HOLDS INTEREST?	D +
GAME DEPTH	D	GRAPHICS	C	VALUE FOR MONEY	D

The object of *Anteater* is to transport four eggs located above ground to your underground nest while eluding the hungry anteaters prowling about. Your joystick-controlled ant can burrow a tunnel anywhere he moves. The anteater, who is slightly faster than the ant, will enter the tunnel once it breaks the surface in order to give chase. The strategy is to dig enough tunnels and cul-de-sacs to confuse the anteater.

Anteater is an arcade strategy game of limited depth. While it is quite easy on the first level, subsequent levels of difficulty add more anteaters. The buried rocks, which can crush a pursuing anteater if your timing is precise, offer little help. Another anteater will soon replace him. The graphics and sound are plain, but this is meant to be a cartridge game that uses only minimal memory for the smallest machines. The game doesn't offer much for the money.

ARCHON

Company: Electronic Arts

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$40.00

Availability: 8

Disk or Tape: Disk

OVERALL RATING	A+	CONTROLLABILITY	A	ERROR HANDLING	N/A
GAME CONCEPT	A+	SKILL INVOLVED	A	DOCUMENTATION	B+
CREATIVITY	A+	CHALLENGE	A	HOLOS INTEREST?	A
GAME DEPTH	A	GRAPHICS	A-	VALUE FOR MONEY	A

Recall those scenes from the movie *Star Wars* in which R2-D2 and Chewabaca are playing a chess-like game aboard the *Millennium Falcon*. The droid's game piece, projected by hologram as a lifelike, goblin-like creature, advances across the board to the square occupied by his opponent's piece and slays it. They must have been playing *Archon*.

Imagine a strategy board game similar to chess with fantasy, role-playing characters as pieces. The object of the game is to defeat each of the opponent's pieces in battle, or control the five power points on the board. Like chess, each piece has relative strengths and weaknesses, and specific movement factors. Unlike chess, the Light and the Dark sides have completely different men that, on the whole, are balanced in strength. Each side's game piece has a counterpart with similar strengths and weaknesses, but different fighting styles. For example, the equivalent piece to the pawn in chess is a sword wielding Knight for the Light forces, and a club wielding Goblin for the Dark forces. The Light forces have one Wizard, two Unicorns, two Archers, two Golems, two Valkries, one Djinni, one Phoenix and seven Knights. The Golems throw boulders while the Djinni hurls whirlwinds, and the Unicorn fires energy bolts. On the other side, the Dark forces have one Sorceress, two Basilisks, two Manticores, two Trolls, one Shapeshifter, one Dragon, two Banshees, and seven Goblins. The Basilisks attack with an eye beam, the Manticores with tail spikes, and so on. Both the Light force's Wizard, and the Dark force's Sorceress can cast spells in addition to fighting with fireballs and lightening bolts, respectively.

The battlefield is separate from the strategy board screen. When two foes challenge each other by occupying the same light, dark, or neutral colored square, they fight in a combat arena that has barriers carrying you through a luminosity cycle. When the barriers match the color of the background, they disappear. During the few brief seconds before and after this moment, opponents can walk through the barriers or penetrate them with missiles. The barriers slow them down. Meanwhile, lifelines at either end of the screen indicate the relative strength of each opponent. When one is wounded, its lifeline is reduced in proportion to the severity of the wound. When the lifeline is zero, the icon is "dead," and combat is over. Combat is a combination of strategy and dexterity skills. A weak, club wielding Goblin can sometimes defeat a powerful Unicorn who hurls fast energy bolts, if the Goblin can corner it and beat it over the head without being hit by the first bolt. The graphics during battle have excellent, realistic animation.

Both the Wizard and the Sorceress are powerful pieces that shouldn't be removed from the safety of their power square. These squares are important in that they accelerate the healing of wounds obtained in battle. The ability to cast spells by these two icons is important to the game's strategic play. There are seven spells and each can only be used once. Some of the more interesting spells can teleport a given piece to any other place on the board, exchange any two pieces on the strategy board, revive a dead icon, imprison an enemy icon, or summon an elemental spirit. This latter spell is particularly useful in attacking a very powerful enemy piece.

The imprisonment spell is useful for keeping an enemy piece on a designated square. During battle on a light square, the Light forces have the advantage, and conversely with the Dark forces on the black squares. Many of the squares (especially the neutral squares) cycle from light to dark in a set pattern. If a piece is imprisoned on a neutral square, you could more effectively attack it when it turned to the color that would give you the advantage. Another spell called Shift Time will reverse the flow of the luminosity cycle.

Archon is one of the most creative and original games that has come along in several years. I'll admit it has its roots in chess and maze-adventure type games, but it is this brilliant combination that works to make it an outstanding strategy and combat game. I tested it with both teenagers and adults. Both groups, regardless of their interest or lack of interest in chess, found *Archon* a totally fascinating game. Despite its complexity, it is quickly grasped by players of all ages. It has great graphics, and will give a lifetime of pleasure.

COSMIC TUNNELS

Company: Datamost

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 6

Disk or Tape: Disk*

OVERALL RATING

B

GAME CONCEPT

B

CREATIVITY

B-

GAME DEPTH

B-

CONTROLLABILITY

B-

SKILL INVOLVED

C

CHALLENGE

C

GRAPHICS

B-

ERROR HANDLING

N/A

DOCUMENTATION

C

HOLOS INTEREST?

B

VALUE FOR MONEY

B-

In *Cosmic Tunnels* you try to break an energy embargo imposed by your arch enemies, the Jebbs. To do this, you must retrieve sixteen precious energy bars located on four neighboring asteroids. These bars power a generating complex on your moon. To reach the asteroids, you must guide your spaceship through a meteor shower. If a meteor hits you, it depletes your ship of energy. You are safe from the meteors once you reach the gate to one of the four warp tunnels, but inside the tunnel you face space mines. If you hit one, your ship loses more energy. They take little effort to destroy, however, since you need only line up your ship, the mine, and the end of the tunnel to destroy a mine. The warp lasts twenty-five seconds.

Upon exiting the tunnel, you must attempt to land on an asteroid. The enemy defense system consists of bases and missile systems, which you can destroy by dropping bombs. You must dodge enemy fire and destroy all of the bases before you can reenter the tunnel and return home. The landing pads are in the open except on one asteroid, where it lies beneath a heavily fortified ledge. Once you land, one of your three astronauts must retrieve the four gold energy bars at the bottom of the screen. During this attempt, you must avoid Space Turkeys, Dynobots, Electric Lizards, or Monstrous Munchers that patrol the asteroids. You can't shoot them, but rocks offer some safety. Pressing the button allows faster movement. Moving the astronaut to the Jetcopter or Rocket Springs launch pads lets you launch him like Superman (using the Rocket Springs) or keep him hovering for a short time (using the Jetcopter). He retrieves the bars one at a time. When he has completed his task, your pilot, Captain Sticky, is ready to head back to the moon base through the warp tunnel. You continue to the rest of the asteroids until you recover all sixteen energy bars or run out of energy.

The four separate screens give enough variety to the game to make it fun and interesting. The graphics are good. The music that plays during the title and high score screens is original. Although not overly difficult, the game is not easy to win.



ARCHON



COSMIC TUNNELS

PINHEAD

Company: Utopia Software

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 3

Disk or Tape: Both

OVERALL RATING	C	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C-	SKILL INVOLVED	C-	DOCUMENTATION	C-
CREATIVITY	D+	CHALLENGE	C	HOLDS INTEREST?	C-
GAME DEPTH	C+	GRAPHICS	C	VALUE FOR MONEY	C

Pinhead is very much like the game *Kickman* in the arcades. In it, you maneuver a clown balanced on a unicycle across the bottom of the screen. Balloons randomly drop from the rack above, and you must pop them with your pointed cap before they hit the ground. You can kick your legs out on both sides to bounce them back up again, but if one hits the ground, you lose your balance and fall.

The second level is even harder. The balloons pile up on top of your head shortening your response time. You must resort to kicking with your legs. When the balloons stack up to about five high, they either begin popping automatically, or one of the monsters pops them for a bonus.

After a brief Pacman-style cartoon intermission comes the third round in which you must catch tossed balloons on top of your head. If you manage to survive this round, upper levels have bonus keys and umbrellas.

Control is by joystick, although I would recommend a trackball: it is difficult to position the clown accurately under the descending balloons. It may be faster to move from the far side of the screen to the other with a joystick, but you'll get higher scores with the trackball even if you miss an occasional balloon.

Pinhead is a fair game, but requires a lot of luck. The theme and game play are copied from the arcade version; however, the fine background and some of the sound effects that made the arcade game enjoyable are missing.

ORC ATTACK

Company: Thorn EMI

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 4

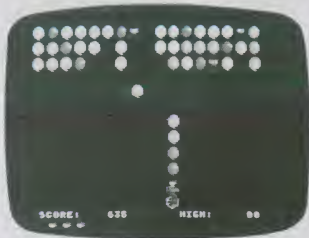
Disk or Tape: Cartridge

OVERALL RATING	C	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	C-
CREATIVITY	B	CHALLENGE	C	HOLDS INTEREST?	C-
GAME DEPTH	C+	GRAPHICS	C+	VALUE FOR MONEY	C-

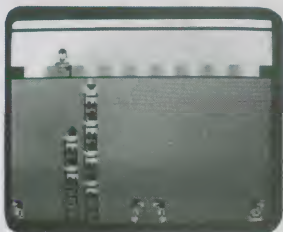
In the arcade game *Orc Attack*, you must defend your castle from the attacking Orcs and their evil allies, the Sorcerer and the dreaded Stone Warts. You guard the castle from the parapet using rocks, swords, and boiling oil. At the beginning, the Orcs move in with short ladders while their bowmen shoot arrows at you. Most of the arrows bounce harmlessly off the battlements. Hurling rocks through the gaps in the stone allows you to fend them off until your boiling oil is ready to drop. The flames quickly spread to their ladders, and the climbing Orcs drop flaming to their deaths. The bodies collect in a grisly pyramid. If you complete the body count pyramid, you gain an extra life for yourself.

Next, the Sorcerer enters, conjuring floating skulls. You must destroy these with rocks before they reach the top of the wall or you lose some of your lives and parts of the walls. It seems unlikely that you can kill the Sorcerer, but you gain a substantial number of points if you hit him. You will also find it difficult to deal with the Stone Warts, which appear between Orc rounds and hurl lightning bolts at you. Should you manage to survive, you face successively more difficult rounds of attack. The Orcs employ higher ladders to bring them nearer the top. Once they reach your level, you grab a sword and try to kill or injure each Orc before it can stab you with its vile dagger. You can deliver a strong blow by pulling the joystick towards you as you press the button, but only a few super blows are available to you. You must use them carefully, perhaps against a Ninja Orc who climbs walls without a ladder.

This game is certainly original. Although it lacks constant action and excitement, the graphics are good and animated. The Orcs could be more evil looking. The game does give you the option of beginning at higher levels of difficulty and lets one to four people play if they alternate. Although hard to identify with, the game is interesting and mildly entertaining.



PINHEAD



ORC ATTACK

Snake Byte

Company: Sirius Software

Language: Machine

Hardware Requirements: 48K, disk drive.

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Disk*

OVERALL RATING	C+	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	C+
CREATIVITY	C	CHALLENGE	B	VALUE FOR MONEY	C
GAME DEPTH	C+	GRAPHICS	C-	HOLOS INTEREST?	B-

Snake Byte is a rather challenging keyboard or joystick controlled game where the object is to devour apples with a steerable snake. But as the snake consumes each apple, it grows longer. Soon you have a snake with a body so long that it becomes a challenge to maneuver without running into the snake's tail. The game begins with ten apples, but if you don't eat fast enough, you're penalized with extra apples. Once you have eaten all of the apples, you advance to the next maze level.

The upper levels, which have barriers or internal walls, are much harder. There is an option to add either one or two bouncing plums to the game. The added challenge is to avoid hitting the plums with the snake's head. A collision costs you one of your three snakes.

Joystick control is very easy to master. The snake turns in the direction you push the stick and it is impossible to double back on yourself. Keyboard control uses two arrow keys to control clockwise and counterclockwise turns, and is slightly more responsive. The graphics are adequate, nothing fancy, where the apples just look like moving signs. *Snake Byte* is a very simple, yet challenging game.

MAD NETTER

Company: Computer Magic, Ltd.

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 2

Disk or Tape: Both

OVERALL RATING	F	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	D	SKILL INVOLVED	D	DOCUMENTATION	C
CREATIVITY	F	CHALLENGE	D	HOLOS INTEREST?	F
GAME DEPTH	F	GRAPHICS	D-	VALUE FOR MONEY	F

Catching butterflies with a joystick-controlled man who wields a butterfly net is the theme in *Mad Netter*. All too often a game with a simple theme leads to a simple game requiring minimal skill and offering little variation. This is certainly the case with *Mad Netter*. The game has a few obstacles, like snakes, dragonflies, and dogs, but these appear and disappear completely at random. Avoiding them is sometimes just a matter of luck. Points are scored for butterflies caught and just for staying alive. Overall, the graphics are poor and the game is terrible. There are better titles in games out of magazines than this one. It gets my vote as "Dog of the Year."

MICROSAILING

Company: Atari Program Exchange

Language: BASIC

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$17.95

Availability: 5

Disk or Tape: Disk

OVERALL RATING	C	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C-	DOCUMENTATION	C
CREATIVITY	C-	CHALLENGE	C+	HOLDS INTEREST?	C-
GAME DEPTH	C-	GRAPHICS	C	VALUE FOR MONEY	C

Microsailing is a yacht racing game that introduces the dynamics of sailing and sailboat racing to microcomputer users. It can be played by one person against the computer or by two players in head to head competition. Buoys mark out four different courses of varying difficulty. A yacht runs through the course before the race to show you how to round the markers. With thirty seconds to start you have to position your sailboat by jibing and tacking so that you pass the starting line within seconds after the race begins. The joystick acts as a tiller; pushing left causes the boat to turn counter-clockwise, pushing right turns the boat clockwise. Beginners soon notice that a boat can't sail directly into the wind but must sail at angles relative to the wind in a maneuver known as tacking back and forth upwind. The wind in this game always blows from top to bottom.

The game uses a good system to remind each sailor where the next gate is. The computer colors the next buoy the same color as your sailboat. The first sailboat to round all the buoys and to cross the finish line wins the race. The game has several levels of difficulty. Beginners can ignore the right-of-way rules, but advanced sailors can adhere to the North American Yacht Racing Union's rules. Time penalties are awarded for violating the Opposite Tack Rule, Same Tack Rule and Changing Tack Rule. Other options include stormy weather which requires you to drop anchor.

The game is of some interest to armchair or landlocked sailors. Certainly as a sports simulation it isn't very exciting, but nonetheless it can be fun to play on rainy days when you'd rather not be out on the open seas. The graphics are nice and use player-missile techniques. It is best to play *Microsailing* with a human opponent because the computer opponent always takes the optimum course and is impossible to beat.

Q*BERT

Company: Parker Brothers

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING	B	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C+	DOCUMENTATION	C
CREATIVITY	B	CHALLENGE	B	HOLDS INTEREST?	C
GAME DEPTH	C+	GRAPHICS	B-	VALUE FOR MONEY	B-

Q*Bert, a round little character who looks like a cross between an anteater and a kiwi, roams a pyramid of twenty-eight squares. You try to land him on every square at least once. This changes the square's color, the purpose being to change the color of the entire pyramid. If Q*Bert hops over the side of the pyramid, he plummets to his death unless he can jump to one of the two disks near the edge. They transport him back to the top of the pyramid, where he once more faces his enemies. These consist of Coily, who hops on a spring and tracks Q*Bert's movements; a red ball that rolls from top to bottom; a purple ball that hatches Coily when it reaches bottom; a green ball on the upper levels that freezes all the characters for a moment if you catch it; and Sam, who changes the color of the squares back to the original, forcing Q*Bert to retrace his path. You can earn a substantial bonus by luring Coily off the board as you jump Q*Bert to a disk.

Each level of the game becomes progressively harder. Not only does Q*Bert face more enemies, but on level two he has to step on each square twice because the first step yields an intermediate color. Upper levels add the complication of squares that change to an intermediate color if you jump on them too many times.

The hardest thing to get used to is the control system. You need to turn the joystick forty-five degrees to achieve diagonal movement, but you discover this only by studying the manual. Except for this, the cartridge represents the original coin-operated game well. Although simple in theme, Q*Bert utilizes a good idea, stresses nonviolent strategy, and holds your interest.

JUICE

Company: Tronix

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$24.95

Availability: 7

Disk or Tape: Both

OVERALL RATING

B

CONTROLLABILITY

B

ERROR HANDLING

N/A

GAME CONCEPT

B

SKILL INVOLVED

B-

DOCUMENTATION

C

CREATIVITY

C+

CHALLENGE

B

HOLDS INTEREST?

B

GAME DEPTH

B-

GRAPHICS

B

VALUE FOR MONEY

B

Juice is a very slick jumping game in which you control Edison, a kinetic android. As he hops from block to block on a flat circuit board (shown in three-dimensional perspective), the blocks turn into electrical traces on the board. All that Edison has to do is touch every square at least once to complete the circuit on the first level.

To complicate matters, a number of characters called Nohms appear and begin bouncing around the board. If one of the Nohms collides with Edison, he melts. The Nohms don't really chase our friend, but a coily capacitor creature called Killerwatt does. There is also Flash, who disconnects the traces, and a cute, round, helpful guy called Recharge. If Edison jumps to several little disks just off the edge of the circuit board to escape, he is transferred to the one on the opposite side where he remains safe.

Each time you complete a circuit, the board flashes and you are advanced to a tougher level. At first the boards are more complicated, but later it takes two or more jumps on any square to turn the square into an electrical trace. A timer ticks away, so if you are quick and efficient you can earn a bonus. There is also a bonus if you can lead Killerwatt off the board (stay in front of him and jump to one of the safe disks; Killerwatt will fall off the board as he tries to follow).

Simple as it is, *Juice* is a very good strategy-oriented arcade game. It can become maddening at times. For just this reason the author gives you a choice of eliminating one or more of your opponents. You can even play without any characters on the board if you need to practice. The graphics and sound are first-rate, and of all the jumping-style games, this one is about the best.



JUICE



Q*BERT

SLINKY

Company: Cosmi

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$9.95

Availability: 4

Disk or Tape: Tape

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

C
C+
C-
C+

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

C
C+
B
C

ERROR HANDLING
DOCUMENTATION
HOLOS INTEREST?
VALUE FOR MONEY

N/A
B+
D+
C+

A variation of the familiar *Q*Bert* arcade game, *Slinky* consists of fifty-four blocks that change color as your slinky hops from block to block. A few adversaries complicate things, but your primary strategy involves the scoring system. You begin with 25,000 points. You lose 100 points every time Slinky moves while he is clean or yellow. Your best chance of survival is catching bonus point objects to avoid losing the game.

Several enemies impede completion of your task, while several allies help you. Marge the Magnet drags you off the screen to your doom; sometimes you get lucky and she drops you elsewhere on the stack. Ralph the Raindrop gets Slinky wet (blue), which lets him travel twice as fast and keeps him free of penalties for landing on the blocks. However, while wet he is vulnerable to Dusty, the moving dust cloud. If Dusty catches your hero, he begins to rust (turns brown). In this state, each move costs you 500 points until you can no longer move. Lorenzo, the dreaded chameleon, moves so quickly that Slinky had better get wet before he reaches the sixth level so that he can outrun him. In addition to these dangerous characters, a number of black holes scattered throughout the stack magically transport you back to starting position. Worse, by the third level the blocks change color every time Slinky lands on them, making it harder to flip all fifty-four to the right color. By the time you hit the sixth level, you face disappearing cubes, black-out conditions, and flashing colors to confuse you.

A tough game, *Slinky* is likelier to be lost by lack of strategy than by encounters with enemies. *Slinky* calls for strategy different from that employed in a game like *Q*Bert*. This adds interest. The graphics are good, with Slinky moving like the slinky toy as he hops from block to block. Joystick control responds well to the diagonal moves necessary.

MR. COOL

Company: Sierra On-Line Systems

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 4

Disk or Tape: Cartridge

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

C
C
C
C-

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

C
C
C+
D

ERROR HANDLING
DOCUMENTATION
HOLOS INTEREST?
VALUE FOR MONEY

N/A
C-
C-
D+

Mr. Cool is basically another *Q-bert* clone with a few added twists that resemble *Pac-Man*. The playing field is a seven-tiered pyramid of hot plates. Our hero is an ice cube who must jump diagonally from plate to plate and turn them all blue. On the first level he only has to land on the plate once, but on subsequent levels it requires two or more landings on each plate. Beneath the plates is a furnace lethal to Mr. Cool if he should miss.

A number of fireballs patrol all of the rows of hot plates; our hero must avoid them at all costs. In addition, four hot springs drop from the top and bounce to the bottom. This makes the game extremely lethal for our ice cube, but he can turn the tables on his adversaries by pressing the joystick once on any one level (this is called "Supercool Time"). For fifteen seconds Mr. Cool can turn the fireballs into snowballs and cool down those hot springs. If he catches fireballs he gains an extra cube, and yet another cube after 20,000 points. There are fifteen rounds to every level, and the levels get faster as you progress.

The graphics in *Mr. Cool* are simple lines on a two-dimensional plane, more of what you would expect in a VCS game. The game exhibits good control when played with "loose" joysticks, but responds poorly with stiff joystick control. It does require some strategy, for like *Pac-Man* you must take the offensive for brief periods of time. In sum, it is a well-made clone.

FROGGER

Company: Sierra On-Line Systems

Language: Machine Language

Hardware Requirements: 16K cassette, 32K disk

Department: Entertainment

Sugg. Retail: \$34.95

Availability: B

Disk or Tape: Both

OVERALL RATING	A	CONTROLLABILITY	B -	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	B -	DOCUMENTATION	B
CREATIVITY	B +	CHALLENGE	B +	HOLDS INTEREST?	B
GAME DEPTH	B	GRAPHICS	A +	VALUE FOR MONEY	A -

Frogger for the Atari is an exact translation of the popular Sega-Gremlin arcade game of the same name. The object is to move your frog in a limited amount of time across four lanes of traffic, then jump on the backs of diving turtles and moving logs across a pond to the safety of home. The frog can jump in any of four directions by moving the joystick controller. Success in the game is strictly a matter of timing: traffic moves in opposite directions in alternating lanes, and the turtles and logs move in opposing directions and at different speeds. When all five frogs have reached home, the game advances to a more difficult level of play. After five levels you are rewarded with an extra frog.

Advanced levels threaten you with tightly spaced cars in the one fast lane, deadly snakes that patrol the bank and some of the logs, and hungry alligators and otters that move with the current. Logs become faster and fewer, and the diving turtles are prone to vanish just when you need them. Bonuses are awarded for escorting a lady frog home, and for gobbling insects. The game has a slow and a fast speed mode to suit all players.

Frogger's sound and graphics exploit the machine's potential to the fullest. Layered scrolling character graphics and player-missile animation are apparent throughout the game. The author was able to get more than the usual number of colors on the screen by changing them part way down the screen during a display list interrupt. Sounds include multi-part harmony. Most of the music is identical to that of the parent arcade game; but several additional tunes have been added, so the music isn't as repetitive. Even so, the jingle becomes tiring after long play. Mercifully, you are allowed to toggle the music off without eliminating the necessary sound effects.

Frogger is an addictive and enjoyable arcade game, especially to children. It is absolutely first rate in graphics and sound. It is a good choice for your game library.

MELTDOWN

Company: Cosmi

Language: Machine Language

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$9.95 cassette/\$14.95 disk

Availability: 4

Disk or Tape: Both

OVERALL RATING	C +	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B -	SKILL INVOLVED	B -	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	A -	HOLDS INTEREST?	C
GAME DEPTH	C +	GRAPHICS	C +	VALUE FOR MONEY	B

The goal in *Meltdown* is to deactivate the five nuclear reactors at the top of the screen before they reach meltdown. The thermometer at the bottom of the screen indicates their temperature. It slowly creeps upward, but as you deactivate each reactor the temperature drops slightly, buying you more time.

Game play is very much like *Frogger*. You must first proceed through three levels of moving radioactive clouds in order to enter the corridor leading to the reactor chambers. This corridor often hits you with a random bolt of atomic energy which you must avoid at all costs. You next enter a series of rows of moving reactor chambers beneath the five cores. Movement is up, down, left, and right; but once you leave a rectangle by moving up or down, it disappears (unless it was one of the specially marked free chambers). If you can make it all the way up to the reactor tower and back down again without losing one of your five men, then that reactor core is deactivated.

Meltdown is a very challenging game, although not fundamentally different from other games of this type. The graphics are colorful, but the sound leaves something to be desired. It is a high-pitched, pulsating, reactor-like sound. Unfortunately, it is obnoxious and irritating. I'd advise turning the sound off, except you need to hear the warning sound of the energy bolt in the central corridor. For sanity's sake, turn it down as low as possible. One final point: although the game lacks the appeal of its competition, it is less than half the price.

PACIFIC COAST HIGHWAY

Company: Datsoft

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Both

OVERALL RATING	C+	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B-	SKILL INVOLVED	B-	DOCUMENTATION	C+
CREATIVITY	C	CHALLENGE	B	HOLOS INTEREST?	C+
GAME DEPTH	C+	GRAPHICS	B-	VALUE FOR MONEY	C+

Picture a little rabbit at rush hour trying to cross two four-lane highways separated by a medium strip. And if he is successful he must next hop across a pond from one moving boat to another, each going the opposite way, until he has crossed the pond to his home. Well, that brave little wabbit has nothing to fear, for he has three lives in this challenging arcade game.

Pacific Coast Highway is a variation of the popular *Frogger* and *Freeway*-type games. It is animated on two distinct screens: one highway and one water. The game becomes trickier with each level. The medium strip between the two highways offers no resting spot for a gap in the traffic. All you can do is jump off the curb and hope for that wabbit. Level three's medium strip, meanwhile, is constantly changing direction.

The graphics and sound are fair in this game; but although it offers something of a challenge to the uninitiated, it cannot lay claim to originality.

PREPPIE

Company: Adventure International

Language: Assembly

Hardware Requirements: 16K, cassette; 32K, disk drive.

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Both

OVERALL RATING	B-	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B-	SKILL INVOLVED	C+	DOCUMENTATION	A
CREATIVITY	C+	CHALLENGE	B+	HOLOS INTEREST?	C
GAME DEPTH	B-	GRAPHICS	B-	VALUE FOR MONEY	B

Preppie involves retrieving out-of-bounds golf balls at the Nasty Nine golf course. It seems that this task is the booby prize for losing the Skeezer's Loop, the annual Freshman oyster-eating bash. The groundskeeper delights in torturing his latest victim, making the out-of-bounds area at Nasty Nine a dangerous place indeed.

Your *Preppie* must be maneuvered by joystick across a fairway crisscrossed by speeding golf carts and lawn-mowing maintenance men. If he reaches the river bank (and you better hope he doesn't encounter a giant frog), he must jump from moving canoes to drifting logs to the rough on the river's far side. That's where most of the missing balls will be found. You must then get your *Preppie* safely back to the course before the timer runs out. The quicker you fetch the stray balls, the more points you receive.

It seems apparent that *Preppie* is loosely based on the arcade game *Frogger*, as are several other games. Animation graphics are very good, and the sound is nicely done using two-part harmony. I can't say that it's very original in design; but, like *Frogger*, it is lots of fun.

SPIDERQUAKE

Company: Gentry Software

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

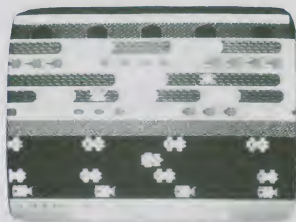
Sugg. Retail: \$16.95

Availability: 4

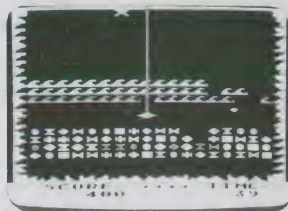
Disk or Tape: Both

OVERALL RATING	F	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	D	SKILL INVOLVED	D	DOCUMENTATION	D+
CREATIVITY	D	CHALLENGE	C	HOLOS INTEREST?	F
GAME DEPTH	D-	GRAPHICS	D	VALUE FOR MONEY	F

Spiderquake makes a poor attempt to copy *Frogger*. You try to maneuver a spider across alternating bands of highway traffic, a quaking band of trash cans, a moving log, and up a mountainside to a cave. While you won't find it difficult, you will suffer motion sickness. The graphics are animated but crude. This attempt to simulate an earthquake fails miserably.



FROGGER



SEA BANDIT

PRINCESS AND THE FROG

Company: Romox, Inc

Language: Machine

Hardware Requirements: 8K

Department: Entertainment

Sugg. Retail: \$44.95

Availability: 6

Disk or Tape: Cartridge

OVERALL RATING	D	CONTROLLABILITY	D+	ERROR HANDLING	N/A
GAME CONCEPT	C+	SKILL INVOLVED	C-	DOCUMENTATION	D
CREATIVITY	D	CHALLENGE	C+	HOLDS INTEREST?	D
GAME DEPTH	D+	GRAPHICS	C-	VALUE FOR MONEY	D-

The *Princess and Frog* cartridge is yet another game similar to *Frogger*. The object this time is to make a successful journey with your frog past a field of jousting knights, then through a moat filled with alligators and snakes to the castle gate. If you manage to reach the gate showing the princess' lips, you are magically transformed into a prince. Each journey must be completed within 60 seconds. It isn't a particularly difficult game, but the alligator's quick submergence when your frog is on its back adds to the challenge.

The game isn't much different from all the other clones. The graphics are plain with little or no animation. The sound effects lack music, but there is little room on a 4K cartridge for this. In sum, if you want to play *Frogger*, choose the real one.

SWAMP CHOMP

Company: Program Design

Language: Machine

Hardware Requirements: 32K (disk); 16K (cassette)

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 3

Disk or Tape: Disk

OVERALL RATING	C-	CONTROLLABILITY	B-	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C+	DOCUMENTATION	C
CREATIVITY	C-	CHALLENGE	B	HOLDS INTEREST?	C-
GAME DEPTH	C	GRAPHICS	C-	VALUE FOR MONEY	C-

Swamp Chomp is a game similar to *Frogger* with a few added twists. You guide a Gorx across a swamp, past rows of moving swamp critters, to an area where it can leapfrog from one moving machine to another, finally reaching the feeding station on the far side. The Gorx then metamorphoses into a Swamp Chomper, a big-mouthed creature. For nine brief seconds it can devour its enemies in the swamp. If it runs out of chomping time the other creatures in the Muckedoo Swamp will eat it. Eating a ghost will add another nine seconds of chomping time. Other dangers soon appear, such as a bat who can best even a Swamp Chomper.

The game, which offers thirteen increasingly difficult levels of play, is harder to master than *Frogger* even on the easiest level. The graphics are fair, using character set animation; but the use of sound is minimal, offering no music and few sound effects. The game certainly deserves no credit for originality, but has its place in the market.

SEA BANDIT

Company: Gentry Software

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$16.95

Availability: 4

Disk or Tape: Both

OVERALL RATING	C-	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C-	DOCUMENTATION	C-
CREATIVITY	C-	CHALLENGE	C	HOLDS INTEREST?	D+
GAME DEPTH	D+	GRAPHICS	C	VALUE FOR MONEY	C-

In *Sea Bandit* you must collect four rows of colorful treasures at the bottom of the ocean by first breaking through three rows of ocean waves with your bouncing energizer. Your joystick controls a treasure probe that guides the bouncing energizer down to the bottom of the ocean.

Two things complicate the game. First, it is a timed game so that you need to work very quickly to clear an entire level before the clock runs out. Second, mines continually rising from the bottom of the ocean are set to destroy your probe. A mine catcher at the top that moves back and forth across the screen can be operated by holding the joystick button, but this freezes the probe. Catching a mine adds three seconds to the clock. This mine catcher can also blow up an energizer, of which you have only five.

Sea Bandit requires intense concentration. Some will dismiss it as just another variation of *Breakout*, but those who play it may find that it offers a slow-paced yet substantial challenge.

HOT LIPS

Company: London Software

Language: Machine

Hardware Requirements: 16K, disk drive.

Department: Entertainment

Sugg. Retail: \$29.95

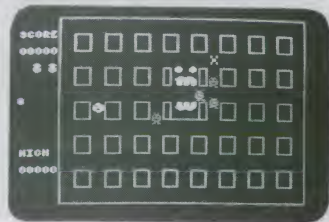
Availability: 5

Disk or Tape: Disk

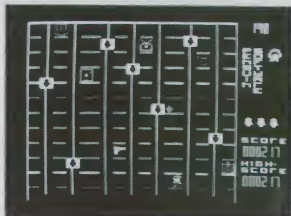
OVERALL RATING	C	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	C+	HOLDS INTEREST	C
GAME DEPTH	C-	GRAPHICS	C	VALUE FOR MONEY	C

Hot Lips is an arcade chase game played on a grid-like maze. The object of the game is to lure or lead pursuing critters through chomping teeth so that they get eaten. Of course, if you aren't too careful, you could end up as dinner too. As you move around the grid, bonus boxes appear worth extra points if you reach them quickly; otherwise, they mutate to blockers. These red blocks slow you down when your joystick controlled man moves across them. They can cause your doom, especially if a critter is close behind — blockers don't slow them down at all.

Hot Lips is a game requiring fast thinking to outmaneuver the four or five pursuing critters on the grid. You are continually moving unless you hold the button down to stop. While the first level is easy, upper levels are fast-paced with many blockers to slow you down.



HOT LIPS



SPY'S DEMISE

DROIDS

Company: TG Products

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$44.95

Availability: 4

Disk or Tape: Cartridge

OVERALL RATING

C-

GAME CONCEPT

C-

CREATIVITY

D-

GAME DEPTH

D

CONTROLLABILITY

B

SKILL INVOLVED

D

CHALLENGE

C-

GRAPHICS

C-

ERROR HANDLING

N/A

DOCUMENTATION

D+

HOLDS INTEREST?

C-

VALUE FOR MONEY

D

Droids, despite its inherent simplicity and lack of depth, is an interesting game. As the pilot of a spaceship, you discover to your dismay that two robots have escaped their cubicles and deactivated the life support system. You spot them moving towards the communications station. By the time you arrive, they have turned off the other two systems and are roaming the halls. Starting at the recharging station (bottom left of the screen), you proceed up the elevator to turn on the system first deactivated. Your integrator beam transports the droid blocking your path back to its cubicle at the right side of the screen, where it remains for at least three seconds. Turn the system to stand-by, but return to the recharging station to restore full power. By now both droids have returned to the grid of passageways, and one droid turns off another subsystem before you can prevent it. The game becomes a race against a three minute clock, as you try to touch the four subsystems twice before the droids succeed in turning another off (a subsystem requires two touches to reactivate). If you succeed, you advance to a harder level; if you fail, you lose a character.

The game becomes interesting when you introduce strategy, such as roaming the corridors in an attempt to head off the droids. Note that several horizontal barriers in the grid prevent free movement. The graphics are simple but adequate, and although neither fast nor exciting, the game is fun to play for short periods. I thought it overpriced, but my only other complaint is that the cartridge fits so tightly into the slot that you have to give it a good yank to get it out.

SPY'S DEMISE

Company: Penguin Software

Language: Assembly

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING

C+

GAME CONCEPT

C

CREATIVITY

C-

GAME DEPTH

D+

CONTROLLABILITY

C

SKILL INVOLVED

C+

CHALLENGE

B

GRAPHICS

C+

ERROR HANDLING

N/A

DOCUMENTATION

C

HOLDS INTEREST?

C-

VALUE FOR MONEY

B-

Spy's Demise is a mildly entertaining game in which you attempt to guide a secret agent, disguised with dark glasses, trenchcoat and briefcase, to the top of a twelve story building while guards try to crush him with the elevators in which they ride. You use either a paddle, Atari joystick, or keyboard arrow keys to guide your figure from one side of the floor to the other past seven dangerous ascending and descending elevators. At the end of each floor is a lift to take him up one level. Maneuvering past the elevators is tricky since there is no stop position, and to remain relatively still requires you to change directions quickly. Although the control system is frustrating, there would be little challenge involved if you could remain still and simply wait for the elevator to pass.

The points you get for each level depend on how much time is left on a digital display at the top of the screen. You really can't dally, but occasionally a flashing decoder ring, worth 100 bonus points, may tempt you to risk one of your six men in order to retrieve it. There are other bonuses for objects that you pass over, such as a gun. These objects have no other use during the game. Finally, when you reach the top of a building you get part of a coded message. If you somehow manage to reach the top of all nine successively shorter buildings, you will have all the clues needed to solve the cryptogram and win a free T-shirt.

While the game's graphics are simple but colorful, the music played throughout is outstanding, featuring several long classical pieces, most of them instantly recognizable. Among the better known works are Brahms' "Hungarian Dance #5," Khachaturian's "Sabre Dance," and Tchaikovsky's "Russian Dance" from his *Nutcracker Suite*. Each is professionally done, making good use of harmony.

Spy's Demise is a difficult yet amusing arcade-style game. While it has little depth and may bore many, it is likely to become mildly addicting to those who get past the frustrating control system. It is a game with a fun theme.

JOUST

Company: Atari

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 9

Disk or Tape: Cartridge

OVERALL RATING	A-	CONTROLLABILITY	B+	ERROR HANDLING	N/A
GAME CONCEPT	A-	SKILL INVOLVED	B	DOCUMENTATION	B
CREATIVITY	A	CHALLENGE	B+	HOLDS INTEREST?	A-
GAME DEPTH	B	GRAPHICS	B	VALUE FOR MONEY	B+

In *Joust*, you engage a team of computer-controlled flying knights in combat while mounted on a flying ostrich. You try to unseat enemy riders and retrieve the eggs that result from the collision. Your lance must be higher than your opponent's lance for you to win, but collisions need not be head on. You can just as easily bop him on the head by descending on top of him (flapping your bird's wings with the joystick button). Your enemies have different skill levels depending on their color. The four red knights on the easiest level are joined by four aggressive gray riders on the expert level. Shadow lords possess even more power. In addition, a pterodactyl appears if you take too much time to complete a wave, a Lava Troll pops up after fire destroys the bottom ledge, and uncollected eggs hatch into hostile creatures. The eggs fall to the ledges at the bottom and sides of the play field. Both the ledges and the islands suspended in the center of the screen act as barriers or landing platforms. Players bounce off harmlessly.

Joust gained popularity in the arcades because of its creativity and the option for two people to play as allies against the computer. The home computer translation remains true to the original, although its graphics are not quite as colorful. Flying is animated well, even though the birds look rather squatly. Sound effects equal those of the arcade version. Because of its playability and challenging skill levels, *Joust* is destined to become a winner.

DRELBS

Company: Synapse Software

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 7

Disk or Tape: Disk*

OVERALL RATING	B	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	B-	DOCUMENTATION	B-
CREATIVITY	B+	CHALLENGE	B-	HOLDS INTEREST?	B-
GAME DEPTH	B-	GRAPHICS	B-	VALUE FOR MONEY	B-

Drelbs took a vivid imagination to create. In this game you try to defeat the evil Trollaboars who have imprisoned your land (represented by an atomic flip grid). To defeat them, you hop around the grid flipping gates (ninety degrees each move) to form squares. A loose destroyer Trollaboar moves around the grid destroying the squares that you build. His touch is lethal, but you can briefly imprison him in a square.

Screwhead Tanks patrol the perimeter of the grid, firing bullets that ricochet off the gates. I hardly consider them dangerous; few of their bullets have ever made a direct hit. Gorgolytes that occasionally appear in the windows of your completed squares offer little threat. While they can't harm you, they do eventually release the square. If a lady Drelb prisoner appears in a window, you gain bonus points if you succeed in jumping into the window while she is still there. In addition, a heart-shaped figure momentarily freezes the Trollaboars.

Eventually, you complete the squares and jump through the Drelb window to free your people held prisoner in the Dark Corridor. Your only other means of passage is to catch the magic diamond that occasionally appears; it opens the window for you. Once in the Dark Corridor, you must work quickly to free every Drelb that you touch. The Trollaboars feel your presence and hunt you relentlessly until they throw you back into the grid. It is their cousins, the Gorgolytes, who act as slavemasters in the Dark Corridor.

Drelbs is imaginative and challenging. Random motion will not help you complete the blocks in the grid, so you must use careful strategy to win. Once I understood the game's concept and rules, I found it very playable.

KABOOM

Company: Activision

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 5

Disk or Tape: Cartridge

OVERALL RATING

C-

GAME CONCEPT

B-

CREATIVITY

C-

GAME DEPTH

C-

CONTROLLABILITY

C+

SKILL INVOLVED

C

CHALLENGE

B-

GRAPHICS

C

ERROR HANDLING

N/A

DOCUMENTATION

C-

HOLDS INTEREST?

C-

VALUE FOR MONEY

D+

Activision converted their VCS cartridge into *Kaboom*. Naturally, the computer's higher resolution allowed them to improve the graphics, but the result remains a simplistic eye-hand coordination game of reflex. Your object is to catch bombs dropped by the Mad Bomber, an escaped convict. He begins dropping the bombs slowly, in groups of ten, as he moves back and forth across the top of the screen, but he soon increases his speed and doubles the number of bombs. You use a three-tiered paddle or a joystick-controlled water bucket that moves along the bottom of the screen to catch the bombs. If one hits the ground and explodes, you lose a tier. When you lose your bucket, the game ends.

Kaboom becomes interesting only in the two-player game called "Pitch and Catch." The players take turns as the bomber and the catcher, switching when the catcher misses. At least here you can develop a feeling of competition, and with it a reason to play the game. While *Kaboom* found a large audience in the VCS market, computer owners expect games with more depth of play.

AVALANCHE

Company: APX

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$24.95

Availability: 5

Disk or Tape: Both

OVERALL RATING

C-

GAME CONCEPT

C

CREATIVITY

C

GAME DEPTH

D

CONTROLLABILITY

B

SKILL INVOLVED

C

CHALLENGE

B-

GRAPHICS

C-

ERROR HANDLING

N/A

DOCUMENTATION

C

HOLDS INTEREST?

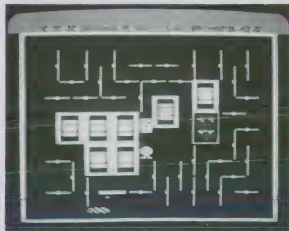
C-

VALUE FOR MONEY

C-

Avalanche is a simple but challenging game requiring good manual dexterity and lightning fast reflexes. Six layers of different sized rocks poise at the top of the screen. You maneuver a stack of six rectangular shields at the bottom of the screen with a paddle controller. The object is to absorb the rocks with your shields without letting one hit the ground. Part of the difficulty encountered is that your shields become worn away from the impact of the endless stream of rocks.

The game can be played competitively by two players taking turns. Both the difficulty level and the number of rocks you are allowed to miss can be adjusted for each player. Overall, the game is fast, simple, and challenging.



DRELBS



JOUST

SUPER BREAKOUT

Company: Atari
Language: Machine
Hardware Requirements: 16K

Department: Entertainment
Sugg. Retail: \$34.95
Availability: 10
Disk or Tape: Cartridge

OVERALL RATING	C+	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C+	SKILL INVOLVED	C-	DOCUMENTATION	C+
CREATIVITY	C	CHALLENGE	C	HOLDS INTEREST?	C
GAME DEPTH	C-	GRAPHICS	C+	VALUE FOR MONEY	B

Super Breakout is an advanced version of the classic game, *Breakout*, in which the object is to score points by knocking out colored bricks from a wall with a ball deflected off of a movable paddle at the bottom of the screen. The ball must be kept in continuous motion, or it is lost. Very popular when it first appeared on the market several years ago, the game is still a classic.

This version offers four variations of the original game. Each can be played by up to eight players (assuming you have four sets of paddles). *Breakout* and *Progressive* are single paddle, single player ball games. *Progressive* is by far the most interesting game on the cartridge. As you play two groups of bricks five rows deep move up slowly towards your paddle. This makes the game more difficult, since it decreases your reaction time. Eventually, as you clear the bottom rows of bricks, others begin appearing at the top of the screen in an endless procession.

Double and *Cavity* are two paddle, multiple player ball games. The two paddles are arranged one above the other. If you can keep two balls in play at the same time, the point values of the bricks are doubled. While *Double* serves two balls, one after the other, *Cavity* doesn't release a second ball until you break into the bricks surrounding the cavity where they are trapped.

Super Breakout is a nice upgrade of the original VCS game cartridge. The graphics are slightly better. The game, as I mentioned, is a classic. With the addition of *Progressive*, it seems well worth adding to your collection.

CAPTAIN COSMO

Company: NEXA
Language: Machine
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: \$35.00
Availability: 5
Disk or Tape: Disk

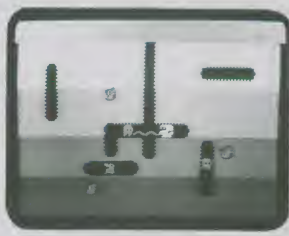
OVERALL RATING	C-	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C-	SKILL INVOLVED	C+	DOCUMENTATION	C
CREATIVITY	B-	CHALLENGE	B	HOLDS INTEREST?	D+
GAME DEPTH	C-	GRAPHICS	B-	VALUE FOR MONEY	C-

Captain Cosmo is an arcade-style game that was obviously designed for young children. It is a cute game in which Captain Cosmo attempts to rid the universe of the dreaded Munchies by caging them in the zoo. Captain Cosmo can fly. He possesses a Somanizer ray gun which temporarily tranquilizes the Munchies. These yellow, strange looking, round-faced Munchies (who are wearing baseball caps) are normally deadly to the touch. When they are zapped they turn green, enabling Captain Cosmo to herd or carry them safely to the zoo. Of course, he has adversaries. Devious Dan is the arch enemy. His ray gun desomanizes the Munchies, and if he touches any part of the zoo he lets them out. Spacey Stacey is a flying saucer that beams up the Munchies from the zoo. If she does this, you lose your bonus points.

While the game offers nicely animated graphics (even Captain Cosmo's cape flutters as he flies), and a cute tune plays throughout, the game is generally difficult and frustrating to young children. Even on the lowest level of play the Munchies move too fast and all too randomly. There is a choice of a hundred different levels. The easiest merely pit Captain Cosmo against the Munchies, while the upper levels have Devious Dan either flying or walking, with or without the ability to shoot. Other levels include Spacey Stacey. The control system is very responsive, but the player must be extremely wary of nearing any yellow Munchie: they move very quickly and unpredictably. Captain Cosmo gets killed so fast and often that a child may soon abandon the game.



CAPTAIN COSMO



DIG DUG

DIG DUG

Company: Atari, Inc.

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$44.95

Availability: 9

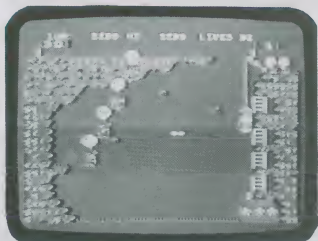
Disk or Tape: Cartridge

OVERALL RATING	B-	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	B-	DOCUMENTATION	C
CREATIVITY	C+	CHALLENGE	B	HOLDS INTEREST?	C+
GAME DEPTH	C-	GRAPHICS	C+	VALUE FOR MONEY	C

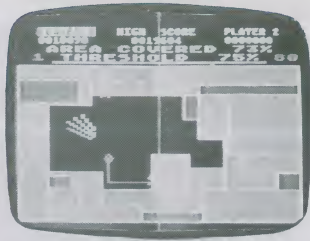
Dig Dug is an arcade game in which the hero of the same name burrows through the earth in search of monsters who are trapped in their own miniature tunnels. Two types of monsters can kill Dig Dug on contact: Pookas and Fygars. The latter are extremely dangerous fire-breathing creatures. Dig Dug has to time his entrance into their area, and then quickly pump them up with the push of the joystick button until they explode. Tackling a Fygars is very chancy. The creature can even burn our hero from a short distance beyond the tunnel. The best bet is a side attack, for it is worth more points.

Both the Fygars and the Pookas can turn into ghosts and escape from their tunnels only to reappear just behind our fleeing hero. You must wait until they metamorphosize back into their original form because you can't kill ghosts. Another way to kill the monsters, but one that requires careful timing, is to let Dig Dug tunnel under a boulder and let the falling rock crush the monsters as they pass. After two rocks have fallen, a bonus fruit appears, and when you have killed all of the monsters, you advance to a harder level. These levels have more monsters (sometimes two in each tunnel), a greater percentage of Fygars, and much shorter time periods for the monsters to turn into ghosts. Any of these advanced levels can be reached with the Option-key at the start of the game.

Dig Dug is fairly close to the arcade version with the exception that our hero seems to move somewhat slower. The graphics are good with a little less color variation in the playfield or background. Game play is repetitious; only the skill involved to kill the monster varies with each level. The arcade game has a lot of devoted fans, so I'm sure this cartridge will attract the same audience.



POOYAN



QIX

POGOMAN

Company: Datamost

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 6

Disk or Tape: Both

OVERALL RATING **C-**
 GAME CONCEPT **C**
 CREATIVITY **C**
 GAME DEPTH **C**

CONTROLLABILITY **C+**
 SKILL INVOLVED **B-**
 CHALLENGE **B-**
 GRAPHICS **C-**

ERROR HANDLING **N/A**
 DOCUMENTATION **C**
 HOLOS INTEREST? **C-**
 VALUE FOR MONEY **D**

A man on a pogo stick who puts out streetlights by shattering the globes is an eccentric method of lighting control in any town, but this is the premise and goal in the game *Pogoman*. You control a man riding a pogo stick, and since he scores points only when he bounces, it is best to keep him hopping. Pushing up on the joystick causes him to jump high and far for the most points, while pushing the stick right gives you a short, safer jump for fewer points. When not hopping, the man slides unrealistically along as the background scrolls past.

Obstacles abound in this game, and they require careful timing to negotiate. In the beginning they remain stationary: a few boxes, fire hydrants, and cars blocking your path are among them. Higher levels add moving dogs and a man teetering on a unicycle. Only when all of the streetlights have been turned off do you advance to the next difficulty level.

Pogoman isn't much fun as a game, but it has one redeeming feature: colorful and well animated graphics. The scrolling background screen is detailed, using character graphics to form buildings, lamp posts, fences, and trees. The flags on the buildings wave in the wind, the clock's hands move, birds fly in the sky, and the man on the unicycle looks like he is really riding it. I can't say as much for the detail of the man on the pogostick, but he crashes well with a tuck and a roll. You could call the game "cute," and it has a catchy tune that plays softly and continuously in the background.

Is it worth buying? It would be fun for a pre-teen, but should be more reasonably priced. Moreover, it lacks a two-player mode so it isn't a competitive game in the vein of *Aztec Challenge*. Cute and clever it is, but it won't hold your attention for extended play.

POOYAN

Company: Datsoft

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Both*

OVERALL RATING	B-	CONTROLLABILITY	B+	ERROR HANDLING	N/A
GAME CONCEPT	B-	SKILL INVOLVED	C+	DOCUMENTATION	C
CREATIVITY	C+	CHALLENGE	B	HOLDS INTEREST?	B-
GAME DEPTH	C+	GRAPHICS	B	VALUE FOR MONEY	B-

In *Pooyan* you battle a pack of vicious wolves to protect your helpless piglets. You hang in a tram suspended from a pulley on a cliff. A pack of thirty-two wolves begins to descend to the valley by hanging on to balloons. You move up and down shooting arrows at them. Because they hide behind shields while throwing acorns at you, your best bet is to pop their balloons. If any of them land safely, they climb the ladder behind you. If one bites you or hits you directly with an acorn, you fall out of the tram. When you have killed all of the wolves, you advance to the next scene, in which the wolves grab balloons and try to float to the top of the cliff. Some of the balloons contain two more balloons, requiring three hits for you to kill the wolf. You must shoot accurately in this round, because the wolves try to push a huge rock onto your tram.

In the bonus scenes, you get meat to lure the wolves into letting go of their balloons. The meat lies at the top of the cliff, where you must retrieve it before you can throw it. A second bonus scene (which I have never reached) gives you points for shooting strawberries.

Pooyan is well done, with colorful, animated graphics. It looks and plays much like the coin-operated game of the same name. Although the designers targeted children, the game offers enough of a challenge to interest adults, too.

QIX

Company: Atari, Inc.

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$44.95

Availability: 10

Disk or Tape: Cartridge

OVERALL RATING	B	CONTROLLABILITY	B+	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	B-	DOCUMENTATION	B
CREATIVITY	C+	CHALLENGE	B	HOLDS INTEREST?	B+
GAME DEPTH	C	GRAPHICS	C	VALUE FOR MONEY	B-

Qix is an abstract arcade game blending quick strategy with hand-eye coordination. The object of the game is to box in a *Qix*—a series of moving lines that resembles a spinning helix. You accomplish this by filling 75 percent of the screen with colored boxes. The boxes are formed by drawing lines called *Stix* with your joystick controlled marker. The slow speed produces red boxes that are worth double the score. When you have covered the threshold area in the allotted amount of time, you move on to a harder level and a brand new screen.

The *Qix* itself is your worst menace. If its random, unpredictable path touches your lines before you complete a box you lose one of your three markers. At the same time, two *Sparx* are on your tail, and when the clock runs out, two more join the chase until there are a total of eight. The moment you stop drawing, a fuse ignites and runs up your *Stix* to destroy you. Finally, by the time you reach the third screen, two *Qix* confront you instead of one.

Sometimes you can make a quick dash across the screen and fill it up, but you won't always be that lucky. Draw a lot of small boxes to confuse the *Sparx* and keep them off your tail. This is especially important if you choose to play with, say, ten seconds left on the clock rather than the forty second default. Since you obtain bonus points for every percent you fill over the threshold, try to gamble for a big area at the slow speed to complete your goal. This isn't always easy since an unpredictable, cornered *Qix* is likely to touch your *Stix* and destroy your Marker.

The game's graphics are simplistic yet abstract. The sound effects are important in this game as they alert you to danger. Game play is moderate to slow and slows to a crawl as you wait for a large block to fill. The game is unique and will certainly appeal to players who like a challenge yet dislike the eat-the-dots or shooting style games that currently dominate the market.

AMPHIBIAN

Company: Business Data Center

Language: Machine

Hardware Requirements: 16K; disk drive or cassette player.

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 3

Disk or Tape: Both

OVERALL RATING **C +**
GAME CONCEPT **C**
CREATIVITY **B -**
GAME DEPTH **C -**

CONTROLLABILITY **B**
SKILL INVOLVED **C**
CHALLENGE **C**
GRAPHICS **B +**

ERROR HANDLING **N/A**
DOCUMENTATION **C**
HOLOS INTEREST **C**
VALUE FOR MONEY **C**

Amphibian is a cute and colorful game in which a frog climbs out of a pond and up a fruit tree, where it drops fruit on unsuspecting dinosaurs below. If the dinosaur is killed, an extra fruit appears on the tree. The object is to kill as many dinosaurs as possible without running out of fruit.

The frog can't be out of water very long or it overheats and turns red. This necessitates a quick return to the pond to cool off. A bird flies by and eats some of the fruit, usually on an upper branch, and must be killed by ramming it. A climbing monster can also pursue you in your tree. Fortunately, the frog can jump down from one branch to the other, and safely to the water from the lowest branch. Hiding in the water isn't always safe either; one curious looking monster probes the water with a long stick as it passes.

This is a cute game (not a tough one) that would more likely appeal to young children because of its limited depth, and its choice of fast and slow levels of play. The game does get progressively faster as you play. The graphics are colorful and nicely implemented, and the program provides a very catchy tune. This is definitely a quality product for the children.

TRACK ATTACK

Company: Broderbund Software

Language: Machine

Hardware Requirements: 32K, Disk Drive

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Disk*

OVERALL RATING **D +**
GAME CONCEPT **C -**
CREATIVITY **C +**
GAME DEPTH **C -**

CONTROLLABILITY **B -**
SKILL INVOLVED **C**
CHALLENGE **B -**
GRAPHICS **C +**

ERROR HANDLING **N/A**
DOCUMENTATION **C -**
VALUE FOR MONEY **D +**
HOLOS INTEREST? **D +**

Track Attack's game concept is both novel and challenging. Picture a railroad switching yard where a train is shuttling gold loaded at the freight yard's depot. You, the train robber, have a souped up 1928 Pierce Arrow that is capable of ramming the side of the train's boxcar. The trick is to catch the train as it passes a road crossing, ram it, and make off with the gold. You must deposit it at your storage area at the lower right on the screen. It sounds simple, but I forgot to mention that a night watchman patrols the freight yard in his green 1952 DeSoto. If he catches you, you are a dead man. He shoots first and asks questions later.

This watchman is a sneaky devil. He sometimes discovers your gold and attempts to take some of it back to the depot. If he succeeds, you lose the value of that gold plus a penalty of 100 points. However, you can try to steal it back by ramming into him. You can reach bonus levels by aligning your car with the train as it heads north or south on the track on the screen's left side. At that point you press the fire button and jump on the train.

Jumping and running from car to car in an attempt to gain control of the engine is somewhat tricky and requires precise timing on the Atari version. The animation in this segment is superb. The thief jumps and summersaults from one car to the next. When he has control, the game advances to level three. This is a bonus level. The train robber, in a twist of fate, tries to recover eleven pieces of gold scattered on the tracks. He steers the train while the night watchman attempts to prevent the train robber from collecting all of the scattered gold by derailling the train.

As cute and novel as the game is, it suffers from a somewhat crazy control system. It is impossible to reverse the direction of your car, and turns must be executed well in advance of an intersection. If you don't make a turn, the car's steering automatically goes into a series of default turns. Thus, your car appears to be on some random course irrespective of your desired goal. Add this to the randomness of the night watchman's car and a somewhat random train, and the game sometimes appears to be playing by itself. There is no doubt that this game takes getting used to. Despite the excellent graphics and game concept, this is not likely to catch on with the general public.

TUTTI FRUTTI

Company: Adventure International

Language: BASIC

Hardware Requirements: 32K (disk); 16K (cassette)

Department: Entertainment

Sugg. Retail: \$24.95

Availability: 8

Disk or Tape: Both

OVERALL RATING	D	CONTROLLABILITY	C-	ERROR HANDLING	N/A
GAME CONCEPT	D+	SKILL INVOLVED	C-	DOCUMENTATION	C+
CREATIVITY	C-	CHALLENGE	D	HOLDS INTEREST?	D-
GAME DEPTH	D	GRAPHICS	C-	VALUE FOR MONEY	D

The object in *Tutti Frutti* is to consume as many edible objects as possible inside a jungle clearing surrounded by trees. Deadly bugs constantly pursue your joystick-guided set of teeth as you race against the clock to clear a level. The bugs are relentless in their chase, and if one becomes exhausted it is quickly replaced. Eat that dead bug and you gain an extra five seconds on the clock.

Most of the objects that you eat are bananas, grapes, oranges, and plums. On upper levels you will encounter items like the Tutti Frutti Trees (which only appear for a few brief seconds), the Sacred Vanilla Ice Cream Cone (worth lots of points, but eating it angers the bug), the Rooti Frooti Lollipop, the Buggsy Wuggsy Birthday Cake (even cake slows the bug down), and finally the Key to Everlasting Tutti Fruttiness found on level eleven. Each successive level has faster bugs and more trees that act as obstacles. Although you don't have weapons for defense, pushing the button will allow you to escape the bug by paralyzing it for one brief second. This tactic can only be used once in each of your three lives so it must be used wisely.

Tutti Frutti is an average eat-the-dots/chase style arcade game. Joystick control is on the sloppy side, but it isn't a drawback. The rather plain character graphics make no use of animation beyond the bugs that pursue you. In short, the game isn't exciting, is somewhat repetitious, yet offers players who like this style of game a challenge on its upper levels.

BOULDERS AND BOMBS

Company: CBS Electronics

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 4

Disk or Tape: Cartridge

OVERALL RATING	D	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C-	SKILL INVOLVED	C-	DOCUMENTATION	C
CREATIVITY	D	CHALLENGE	C+	HOLDS INTEREST?	D
GAME DEPTH	D	GRAPHICS	C-	VALUE FOR MONEY	D

Boulders and Bombs, a digging game, requires you to get each of your three men across the screen by guiding them through tunnels dug by your joystick-guided auger (automatic digging machine). A number of rocks interfere with the digging, but you can plant bombs detonated by twisting your joystick clockwise in a circle. Hostile birds in the sky above prevent this game from getting too easy. They inject nuclear rods into your tunnels. The rods turn into fungus when they reach the tunnel and block your path. You select the spelunker or the auger by pressing the joystick, and your best bet is to quickly dig a tunnel and a bypass (to keep the spinning blades away from your man) and move a man or two across. This usually works only for a short time, forcing you to go back and clear the fungus-blocked tunnels or dig alternate passageways. The game moves faster if you have lost one or two men, but the only way to win is to wipe out the birds. To do this, you must plant a bomb just below a descending rod and detonate the bomb before the rod separates from the bird. At best, this gives you about one second of leeway, but if a rod hits your man, you lose him.

I did not find *Boulders and Bombs* very interesting. Getting those men across the boulder-cluttered screen seemed like pure drudgery. The time limit of one day and one night didn't really add much excitement. The graphics are decent, but simple. The game just isn't very exciting and can become frustrating, and I think most players will lose interest quickly.

PICNIC PARANOIA

Company: Synapse Software

Language: Machine

Hardware Requirements: 16K; disk drive or cassette player.

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 8

Disk or Tape: Both

OVERALL RATING	C +	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C +	SKILL INVOLVED	C	DOCUMENTATION	C +
CREATIVITY	B -	CHALLENGE	C +	HOLDS INTEREST?	B -
GAME DEPTH	C	GRAPHICS	B	VALUE FOR MONEY	C

Protecting the food on the picnic tables from hordes of ants and spiders is what you must do in *Picnic Paranoia*. Actually, George has a rather rough time of it, as the ants are organized and persistent. The spiders aren't particularly interested in his food, but will bite him if he gets in the way while they spin their webs. The wasps, on the other hand, are out to make George's life miserable. They follow him around and attempt to sting him. If they do, George is deposited in the center of the screen, paralyzed for five seconds.

George, who is joystick controlled, is armed with a fly swatter. Unfortunately, there are a lot of ants, and those that reach the center of the table are often beyond George's reach. Once enough ants have collected, they will attempt to push the food off the table and then off the screen. George's job is to stop them, and, after swatting them all, to push the food back on the table. It sounds simple, but spiders clutter the screen with their webs, and that nasty wasp is always harrasing him and paralyzing him at just the wrong times. Each round lasts 90 seconds, and the next is even harder. The game ends when all of the food is stolen.

Picnic Paranoia is a cute game. It has good graphics, and remains fun to play. The game is probably more suited to children; but adults might enjoy it for a time as well, understanding better what real picnic paranoia is all about.

FIREBIRD

Company: Gebelli Software

Language: Machine

Hardware Requirements: 16K, cassette player.

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING	C	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	B -	CHALLENGE	B	HOLDS INTEREST	D +
GAME DEPTH	C -	GRAPHICS	B	VALUE FOR MONEY	C

A firefighting pig scurries up and down a ladder in *Firebird* while attempting to douse flames set by firebombs dropped by a malicious bird. Yes, its Piggio, the amazing firefighting pig, racing against time to save a burning building and its frightened occupants who would rather leap to their deaths than face the cruel and infernal flames.

Your job is to control Piggio's firefighting abilities. The game is joystick-controlled with up and down movement for ascending and descending the ladder, right and left for positioning the ladder, and the button for activating the hose. It is a high-paced game with firebombs landing every 8-10 seconds. It takes practice to keep ahead of the bombs. You must race into position just after each bomb sets an apartment on fire. If you douse the flames quickly with a squirt from your hose, you can save a section of the floor; however, if you are slow your efforts are hampered by fleeing victims who fall into your arms. Since you can't douse flames while holding a victim, they must be escorted to an overhead helicopter which will whisk them to safety. On its return, the helicopter will drop a replacement apartment unit.

This is a game of uncontained frenzy, one which you are inevitably destined to lose quickly. When two sections of the building burn completely to the ground, it collapses and the game ends. Points are awarded for dousing flames and saving victims. More points are awarded for saving victims and escorting them to the roof than for fighting the fire. However, this is just a short-term gain since, if the building goes, so does the game. If you are skillful enough to keep the bottom row of nine apartments intact with no upper units in existence (seemingly impossible), *Firebird* will award you with 5,000 bonus points and a new building.

The game's graphics are very good and whimsical. I think this game is much more suited to children than adults; however, children might find the game's speed somewhat intimidating, especially beginners. An option of different speed levels would have been appropriate. There is no doubt that the game is challenging, but it becomes an effort to give it your best shot when your fate is sealed in a losing performance. One's ego gets damaged once to often for this contest to sustain any long-term appeal. Piggio simply has too much to handle with this one.

CLOWNS & BALLOONS

Company: Datasoft

Language: Machine

Hardware Requirements: 16K; disk drive or cassette player.

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Both

OVERALL RATING

C +

GAME CONCEPT

C +

CREATIVITY

C -

GAME DEPTH

C

CONTROLLABILITY

C

SKILL INVOLVED

C -

CHALLENGE

C

GRAPHICS

B -

ERROR HANDLING

N/A

DOCUMENTATION

C +

HOLDS INTEREST?

C +

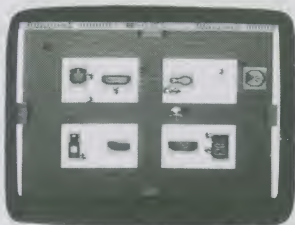
VALUE FOR MONEY

C +

Clowns and Balloons brings a touch of circus ambience to the Atari screen. The object is to pop three rows of moving balloons at the top of the screen with a clown who jumps up and down off of a movable trampoline. The two clowns holding the trampoline are positioned by either a joystick or paddle. Paddle control is definitely recommended, since joystick control never moves the clowns into position fast enough.

The clown, who leaps onto the trampoline from a high ladder on the side, has to be bounced higher and higher until he can reach the overhead balloons. If the clown is bounced off center, and you can't reposition the trampoline in time, you have one squashed clown. Moreover, all of the balloons in the bottom row must be popped before all the balloons in the row above, or you are penalized with another complete row of balloons appearing on the screen. There are also several difficulty levels; but the intricate levels, which are faster and bounce the clown at a near vertical angle, are actually easier to handle.

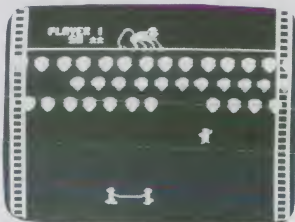
Clowns and Balloons then, with its delightful circus music and cute character and missile graphics, is a very enjoyable rendition. The game, finally, can be played by either one or two players alternating turns.



PICNIC PARANOIA



AMPHIBIAN



CLOWNS & BALLOONS

Tactical Space & War Games

EASTERN FRONT

Company: APX

Language: Machine Language

Hardware Requirements: 16K cassette; 32K disk

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Both

OVERALL RATING	A	CONTROLLABILITY	A +	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	A	DOCUMENTATION	A
CREATIVITY	A -	CHALLENGE	A	HOLDS INTEREST?	A -
GAME DEPTH	A	GRAPHICS	A	VALUE FOR MONEY	A

Eastern Front is perhaps the best-designed computer war game to appear on any microcomputer to date. It gains this distinction by having the finest quality graphics of any war game, and by being so well engineered that the logistics of entering orders is reduced to simple joystick control. It is so outstanding that it earned Chris Crawford, its author, the honor of having designed the best computer game of 1981.

The game recreates the invasion of Russia by the German Army in the summer of 1941. It is the classic battle of strength and mobility attempting to overwhelm a weak enemy whose only assets are endless territory in which to retreat and the natural ally of a brutal winter. Time is on the Russian side: if they hold out until winter, reinforcements will come to their aid. That, coupled with the bitter cold and the German's over-extended supply lines, can give them the decisive advantage.

You command the German Army on a battlefield that stretches over 20 colorful screens. A number of re-defined character sets delineate the various terrain features. The entire screen fine-scrolls from the Polish border to well beyond Moscow, and from Leningrad to the Crimea on the Black Sea. The weather conditions are set by a series of display: light interrupts. The ground turns to mud with the October rains, and the rivers freeze and the snows fall in November.

Screen positioning is entirely governed by the player's joystick-controlled square cursor. Using a joystick for entering the bulk of your orders (cancelled by the space bar) eliminates the drudgery usually associated with computer war games. The player simply moves the cursor to a unit to which he wishes to issue orders, presses the button while moving the cursor in the desired direction, and the order is issued. An Iron Cross shows where you are in the order sequence; and a movable arrow traces the path. By moving the cursor to any unit, even a Russian unit, you can check the corps unit's strength.

The computer calculates its orders while you are entering yours. It never keeps you waiting once you signal the battle to begin. The Russian side can analyze its position, recognize danger and opportunity, avoid traffic jams, recognize the effects of terrain, and plan accordingly. Because the computer works at 1.79Mhz, it can plan strategy faster than human opponents. For that reason, the author recommends against rushing into battle. The computer also improves its own strategy over time.

Each turn, representing one week of actual time, is broken down into 32 subdivisions of time in which combat units move and fight. Thus, a pre-programmed unit might destroy an adjacent enemy unit, advance across a river, engage another unit (forcing it to retreat), and finally advance towards a city within the one turn. Terrain affects both movement and combat. Tanks become bogged down in the marshes, and the enemy has an advantage when the Germans attack across rivers.

The game lasts until the following Spring, a total of 41 weeks. It takes two to three hours to finish the campaign. Actually, the game ends abruptly, with a score between 0 and 255 indicating the outcome. Early in the game it is easy to get a high score, awarded for troops killed and territory gained; but it is difficult to hold that advantage through the winter. Most beginners will follow the pattern of the German debacle by concentrating their forces and becoming mired in the Pripet marshes. A better plan would be to split your forces early, to avoid the Russians concentrating theirs; or crash through the marshes quickly and then split your forces. Regardless of your strategy, you will have to pull back because of uncertain supply lines and bad weather.

Eastern Front is the first war game that non-warriors might enjoy. With its ease of entering orders and its magnificent graphics, a complicated war game becomes enjoyable to play. By all means, if you like strategy games, grab this one quick. Highly recommended.

SHATTERED ALLIANCE

Company: Strategic Simulations Inc.

Language: BASIC & Assembly

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 8

Disk or Tape: Disk*

OVERALL RATING **C +**
GAME CONCEPT **C**
CREATIVITY **B**
GAME DEPTH **B**

CONTROLLABILITY **B**
SKILL INVOLVED **A**
CHALLENGE **B**
GRAPHICS **C +**

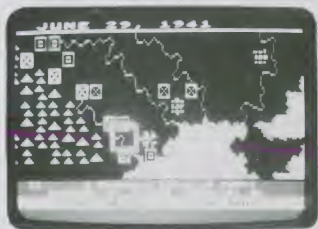
ERROR HANDLING **A**
DOCUMENTATION **C**
HOLOS INTEREST **B**
VALUE FOR MONEY **B**

Shattered Alliance is a tactical war game simulation pitting groups of mythical tribes with varying capabilities against similar opposing forces. Winning is less a matter of destroying opposing forces than it is breaking the opponent's unit and army morale through combinations of encounters. In many regards, this game is similar to a scaled-down version of Strategic's *Operation Apocalypse* on the Apple computer. *Shattered Alliance* is in a completely different setting, however, and uses a new move allowance concept, "Time Points," as an alternative to incorporating any number of squares in a single move for different types of units.

This Time Point concept is both the strength and weakness of this game. Its strength lies in using this approach to speed-up the true game and, perhaps, making for a finer degree of modeling. Its weakness requires the player to react to a near Real Time game, demanding faster reflexes, knowledge of the keyboard, and total concentration on the tactics and strategy being used. A greater weakness is that it leads to one-on-one combats, in which adjacent forces provide neither offensive nor defensive support. Time Points definitely take considerable getting used to, and according to SSI, will be the basis of a series of programs yet to come.

Shattered Alliance features four scenarios for one or two players. The well-done character graphics uses combat units (which are difficult to relate to and differentiate between, especially on a B & W display); two map scales both of which are adequate but very uninspiring; and a Demo game that is very difficult to follow even after a thorough study of the documentation, as it seems to go on, and on, and on. The extensive documentation is light on game specifics beyond describing the screen displays and symbols, examples of combat situations, and information that would make the game more playable. It is heavy on mood-setting "background," as well as detailed descriptions of the various move and factor charts and rule Errata, both of which are included in the program on a separate card.

There is a consistent emphasis on J.R.R. Tolkien-type characters, names, and combat situations which Bilbo and Frodo fans will find both unsatisfactory and insulting. The game is difficult to learn to play, perhaps more so than *Apocalypse*, which is a better, albeit, more expensive game. Once mastered, however, it is perhaps the fastest playing war game yet introduced.



EASTERN FRONT



LEGIONNAIRE

LEGIONNAIRE

Company: Avalon Hill

Language: Assembly Language

Hardware Requirements: 16K, cassette player.

Department: Entertainment

Sugg. Retail: \$35.00

Availability: 5

Disk or Tape: Tape

OVERALL RATING	A	CONTROLLABILITY	A+	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	A	DOCUMENTATION	A-
CREATIVITY	A-	CHALLENGE	A	HOLDS INTEREST?	A
GAME DEPTH	A-	GRAPHICS	A-	VALUE FOR MONEY	A-

The battles between Caesar's Roman legions and the barbarian tribes of southern France during the Gallic Wars (58-51 B.C.) are recreated in this Real Time simulation, *Legionnaire*. In many ways it is quite similar to the author's earlier game, *Eastern Front*. With the addition of movement and orders occurring in a simulated Real Time environment, games only take between fifteen and thirty minutes to play.

The battles take place on a very large, fine-scrolling map which depicts the hilly terrain of southern Gaul. You can command up to ten Roman legions against your choice of an infantry tribe and a cavalry tribe. The game defaults to two very easy tribes, but you can choose two of the tougher tribes. Each of the tribes has its own characteristics, as does each of the Roman legions.

Orders are issued to the legions through the joystick. The cursor is centered atop a legion, and the direction of its next move or next series of moves is entered. Orders can be countermanded by pressing the space bar. Troops should initially be moved to high ground and rested, because these are two of the factors that are weighed during the battle. Other factors to be considered are troop morale, and the shock factor when infantry is attacked by cavalry. Different strategies work against various enemies. Occasionally it is best to hold the high ground, while at other times it is better to lure or drive the enemy into the forest to keep them from concentrating their forces. The game ends either when the tribes have been defeated, or you, Caesar, have been killed by them.

The graphics, like the game itself, are excellent. The sound, however, which is supposed to represent the sound of marching, becomes annoying quickly. *Legionnaire* has incorporated many features that make the simulation realistic. Its ease of use and its wide range of difficulty levels make this a very good introduction to war game playing.

COMBAT LEADER

Company: Strategic Simulations, Inc.

Language: BASIC

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 10

Disk or Tape: Disk, Cassette

OVERALL RATING	B+	CONTROLLABILITY	B	ERROR HANDLING	A
GAME CONCEPT	A	SKILL INVOLVED	A	DOCUMENTATION	B+
CREATIVITY	A	CHALLENGE	A	HOLDS INTEREST?	A
GAME DEPTH	A	GRAPHICS	C+	VALUE FOR MONEY	B+

This tactical game simulates combat between tank and infantry companies on different battlefields. The game consists of variations allowing different levels of play. You command tanks, infantry, rifles, antitank weapons, and mortars against a computer controlled army on varying types of terrain.

The games are well thought out and provide a great deal of variety. The graphics are rather simple, however, and it is difficult to separate the men you command from the opposition since they all look like dark squares or "+" signs. In spite of these drawbacks, the game provides a good scrolling screen and excellent sound effects.

The novice game, which you should play awhile to get comfortable with the controls, pits a tank force of five against a hidden computer tank force of five. The next level, the intermediate game, pits a mechanized infantry platoon that you command against a similar platoon commanded by the computer. This game demands concentration, planning, and a lot of replaying to reach your objective of destroying the enemy.

After these levels, other games are available which let you plan reconnaissance, mobilize defense, seize and hold objectives, and launch attack and destroy missions. If that isn't enough, you can change the playing conditions to create a large variety of games with different terrain and different mixes of forces employed.

A nineteen-page manual explains the game fully and also contains a good deal of military theory. In spite of the drawbacks, the game is addicting because of the great variety of commands at your disposal, the need to check for updated messages as to where the enemy has been spotted, your ability to change from a company commander to a platoon or squad leader to meet varying situations, and so on. The list of orders includes fire, cease fire, mount and dismount, lay down smoke screens, and increase speed of infantry squads.

TIGERS IN THE SNOW

Company: Strategic Simulations Inc.

Language: Atari BASIC & Assembly

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 7

Disk or Tape: Disk*

OVERALL RATING **C**
GAME CONCEPT **C**
CREATIVITY **C**
GAME DEPTH **C**

CONTROLLABILITY **D**
SKILL INVOLVED **B**
CHALLENGE **C**
GRAPHICS **B**

ERROR HANDLING **B**
DOCUMENTATION **C**
HOLDS INTEREST **B**
VALUE FOR MONEY **C**

Tigers in the Snow is a Regimental to Divisional level war game simulation of the 1944 Battle of the Bulge. It offers two rather similar scenarios, differing in length and conditions of victory. Either one or both sides may be played by the computer, and one or two players may compete. The familiar SSI hex grid system and Move Point concept are back, somewhat simplifying the learning process. The game features variable weather, supply, and fuel conditions, which influence the Move Point allowance of each unit. Happily, there is no need for the opponent to ever "turn away" from the screen. It also involves artillery support, reinforcements, optional attacks on each unit by any or all adjacent forces, the probability of independent command actions overriding your orders, and a save game option.

Tigers is one of the faster war games to come along. It is only disk interactive between turns, and the game speed is also a problem in that the status displays flash by too rapidly for planning or understanding. The "hold action" commands of *Operation Apocalypse* are sorely missed. Indeed, there are only three keyboard commands other than the direction numbers and "Yes" or "No" responses. *Tigers* is not as tightly modeled as some of SSI's other games, and makes extensive use of the randomizer leading to a wide range of battle results for a given set of tactics.

As with many SSI games, the documentation is very confusing; be sure to read the "Atari Player's Aid Card" at least twice before even opening the documentation! It is especially poor in defining the meaning and interactions of the various combat commitments that the player is called on to make. *Tigers* has a variety of other aggravating flaws. One is not able to select the sequence in which the units are moved, check the status or location of units, or control the air power when it is available. Symbols indicating the historic and game significant towns, for example, could have been easily added.

Compared to *Operation Apocalypse*, *Tigers in the Snow* is almost as difficult to learn, but is much faster in set-up time and response. It is also easier and simpler to play. It is not as versatile or engrossing as the more expensive *Apocalypse*; however, it is a superior war game to the equally priced *Computer Conflict*. As a minimum, the simplicity of play permits war gamers to enjoy and concentrate on the tactical planning associated with this simulation.

MIDWAY CAMPAIGN/NUCLEAR BOMBER/PLANET MINERS/NUKEWAR/ CONVOY RAIDER

Company: Avalon Hill

Language: Atari BASIC

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$16.00 each

Availability: 4

Disk or Tape: Tape

OVERALL RATING **C**
GAME CONCEPT **C**
CREATIVITY **C**
GAME DEPTH **D**

EASE OF USE **C**
SKILL INVOLVED **C**
CHALLENGE **C**
GRAPHICS **D**

ERROR HANDLING **B**
DOCUMENTATION **D**
HOLDS INTEREST **C**
VALUE FOR MONEY **C**

The Avalon Hill Atari game programs bear little resemblance to their board games, even though several of the names are identical. The well-packaged programs promise involved and sophisticated war-game-like programs. Unfortunately, they are rewritten TRS-80 programs of relatively little complexity, making no use of any of Atari's graphics capabilities. The text displays and "maps" are very simplistic and poorly drawn. Several of these games are fun to play, however, and will hold your interest for several replays. *Midway Campaign* and *Nuclear Bomber* are the best in this regard. They are easy to learn and require few (almost too few) system commands. Generally, they are mediocre in comparison to good games dealing with death and destruction on a grand scale, as controlled by random number generators rather than well-designed algorithms.

MIDWAY CAMPAIGN: Very loosely based on the famous carrier battle of WWII. The computer will search out the opposing fleets. The aircraft quantities and probabilities of hitting the carriers with bombs are stacked in favor of the Japanese in this game. If you are not a war-gamer, *Midway Campaign* is a good challenge; you'll need luck to get them before they get you. (To win, try violating historic naval tactics by dividing your forces.) If you are a war-

gamer, you'll be frustrated by the lack of tactical system commands and tire of the game very quickly.

NUCLEAR BOMBER: As the captain of a nuclear bomber on routine patrol, you are ordered to fly to within 250 kilometers of an identified Russian city and destroy it with your one Megaton weapon. Russian interceptors and missiles don't take too kindly to this idea and are launched against you from Defense Centers, which you can also destroy. The action starts very, very slowly, but picks up rather well. Not much fun for detente dilettantes, however.

NUKEWAR: As leader of a country you may name, you must decide where to stock up on arms, with what and whether or not to initiate a nuclear holocaust with a second country which you also name (I used my Mother-in-law's name). The opposing country may elect to initiate first strike hostilities — after that, it's a matter of a few quick turns, slugging it out, watching cities and bases get wiped out until the Hot Line rings to negotiate a peace. The winner is the country with the fewest million casualties. Little challenge, reasonable luck, but quick and fairly enjoyable. No extension option provided in the game for the effects of radiation poisoning.

CONVOY RAIDER: Very loosely based on the naval engagement and the sinking of the Bismarck, this game requires you to: command the Bismarck; seek, sink or evade four British battleships; locate and destroy the random convoys sailing toward Britain; and return to a friendly port (marked by an “*”) — all this with essentially two commands!! Convoy Raider will tax your brain about as much as it does the Apple (on second thought, that may be an inappropriate analogy).

PLANET MINERS: The Solar System is open for exploration. Four “families” compete to gain the mining rights which may be granted after you orbit one of your five spacecraft about a planet. Claim-jumping, sabotage and protesting other's claims are all cricket. Of the ten system commands, six are for largely redundant information and status tables. The program is perfectly happy playing all four families; if you are still interested in playing after watching such a match, you can replace any or all families by human families. Several kids could easily pass some time, but as a solitaire game it rapidly becomes repetitively uninterestingly long before its forty move limit is reached. Would not exercise the mental faculties of a Fredric Pohl or Robert Heinlein (for you science-fictioners).

ANTI-SUB PATROL

Company: Roklan Corp.

Language: Atari BASIC

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$29.95 (disk), \$19.95 (cass.)

Availability: 3

Disk or Tape: Both

OVERALL RATING	D	CONTROLLABILITY	D+	ERROR HANDLING	N/A
GAME CONCEPT	C-	SKILL INVOLVED	C	DOCUMENTATION	B-
CREATIVITY	D	CHALLENGE	C	HOLDS INTEREST?	D
GAME DEPTH	D+	GRAPHICS	D+	VALUE FOR MONEY	C-

Anti-Sub Patrol makes you the captain of a destroyer in a search and destroy mission against a submarine. Using your sonar, you locate the submarine on the screen grid while avoiding mines and the torpedoes launched by the submarine. If you find yourself directly above the sub, you enter the attack scenario: drop a depth charge at the correct depth and destroy the sub.

This is not an easy game to play. During each turn, you have the choice of either moving or performing a sonar scan. Given the presence of mines, moving blind is a quick way to lose one of your three ships. A scan is equally risky, since the sub may detect your sonar and fire a torpedo at you. Expect to lose ship after ship without getting near your target.

The graphics are unimpressive, which is a surprise in a release from the publisher of *Wizard of Wor* and *Gorf*. The display consists of a matrix of blue ellipses, with a red ellipse for your position and a plus sign for the sighted position of the sub. Most other information is presented in text form.

Anti-Sub Patrol starts with a good concept. Unfortunately, the game is a big disappointment. The author appears to have confused frustration with challenge.

SUBMARINE COMMANDER

Company: Thorn, EMI

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$44.95

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING

B

CONTROLLABILITY

C

GAME CONCEPT

B

SKILL INVOLVED

C

CREATIVITY

C

CHALLENGE

B

GAME DEPTH

B

GRAPHICS

B+

ERROR HANDLING

N/A

DOCUMENTATION

C+

HOLDS INTEREST

C+

VALUE FOR MONEY

C

Submarine Commander is a tactical simulation game. You are the captain of a submarine who must find, attack, and destroy enemy convoys that sail the Mediterranean Sea. Depending on the skill level, the goal is to sink between five and nine convoys. Naturally, more fuel, battery charges, and torpedoes are available on the easier levels.

The game has three view screens, a map showing the current locations of all convoys, your current location, and a periscope view showing passing ships when the submarine is within 25 feet of the surface. An instrument panel has both sonar and hydrophone charts, as well as gauges and damage indicators that display the ship's current status. It is very important to pay attention to the ship's air supply, and the chart showing the depth below the keel when travelling submerged.

A winning strategy requires stealth. You are up against enemy destroyers and patrol boats that accompany the convoy's cargo ships and tankers. You need to continually determine the pros and cons of moving either on the surface or underwater. Remember: your greatest advantage over the enemy is your ability to travel underwater, but you can still be detected if you fire your torpedoes or use your sonar. Should you be detected, enemy guns can cause severe damage if you are near the surface. Evading them by diving deep and cutting your engines will usually end the attack.

The submarine's movement is controlled by the joystick. Rudder control is left and right, and the ship will dive or surface by moving the stick away from you or toward you. Controls seem sluggish to arcade players, but remember that submarines turn very slowly underwater. Torpedoes are fired with the joystick button. There are also a number of keyboard controls. The various view screens are toggled by the M, P, and S keys. Number keys control the engine speed, the C key will crash dive, and the B key blows the ballast tanks to surface rapidly.

Submarine Commander is a very good simulation - type game. It is fairly realistic, except that the enemy calls off its attack all too easily when you dive deep. It requires planning and careful management of limited resources: fuel, battery power, air supply, and torpedoes. The game has nicely detailed graphics that do much to add a touch of realism. Game buyers should be aware that while *Submarine Commander* has some arcade game qualities in certain sequences, it is a long game that lasts from 20 minutes to more than an hour. Not a game of instant gratification, but a fun tactical game requiring time and thought to really play well.



SUBMARINE COMMANDER

Puzzle & Strategy Games

SNARK HUNT

Company: Atari Program Exchange

Language: Machine

Hardware Requirements: 24K Disk; 16K Cassette

Department: Entertainment

Sugg. Retail: \$22.95

Availability: 8

Disk or Tape: Both

OVERALL RATING	B	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B+	SKILL INVOLVED	B	DOCUMENTATION	C
CREATIVITY	C+	CHALLENGE	B	HOLDS INTEREST?	B-
GAME DEPTH	C	GRAPHICS	B-	VALUE FOR MONEY	B

Snark Hunt is a game involving logical deduction. You are given an 8 x 8 box in which snarks are hidden. By shooting a vorpal beam into the box and watching the results, you are able to determine the location of the hidden snarks. Up to eight players may play the game.

A series of arrow markers surround the grid. The joystick cursor can be moved to any of these positions, and the beam can be fired from it. The path of the vorpal beam gives you clues to the snarks' whereabouts. As it moves through the box, the beam is either absorbed by a snark if it's a direct hit, reflected if it passes near the snark, or passes straight through to exit from the box directly opposite the entry point. When you have obtained enough clues, guess the locations of the snarks by marking their positions, and the computer will evaluate your score.

Snarks can be hidden by another player or by the computer. A time limit option can add to the pressure, and the players can choose from four snarks (easy) to nine (nearly impossible) as their level of play.

While it isn't a very exciting game, it is excellent for honing your logic and problem solving skills. The graphics are good, and it remains an all around fun puzzle-type game.

STOCKS AND BONDS

Company: Avalon Hill Game Co.

Language: Atari Basic

Hardware Requirements: 40K

Department: Entertainment

Sugg. Retail: \$20.00

Availability: 6

Disk or Tape: Disk

OVERALL RATING	C+	CONTROLLABILITY	C	ERROR HANDLING	A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	A
CREATIVITY	B+	CHALLENGE	C	HOLDS INTEREST?	C+
GAME DEPTH	C-	GRAPHICS	B	VALUE FOR MONEY	C+

Stocks and Bonds is a stock market simulation. Starting with \$5000 each, up to four players speculate in shares of ten investments. The investments range from municipal bonds to growth company stocks. The object is to accumulate the most money in ten investment sessions, simulating a ten year period. Each player enters data using a joystick.

Novel features of the game are the ability for all players to input data more or less simultaneously, charts showing the performance of each company as the game progresses, and a colorful ticker tape containing the current quotation for each stock.

This program is more successful as an educational program to teach investing than as a challenging game of investing and risk-taking. The ten types of investments appear to be well simulated, so that the player learns about the behavior of the different stocks. The program does not hold interest as a game, however, because the outcome does not seem to be strongly affected by the player's skill.

Two aspects of the program are annoyingly slow. The response of the cursor to the motions of the joystick is very ponderous. Also, a teletype simulation, which could be very effective, runs too slowly and so becomes boring. It does not seem to be a game suited for children, nor of really absorbing interest to adults.

WORMS

Company: Electronic Arts
Language: Machine
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: \$34.95
Availability: 5
Disk or Tape: Disk*

OVERALL RATING	B-	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	A-	SKILL INVOLVED	B	DOCUMENTATION	C+
CREATIVITY	A	CHALLENGE	B-	HOLOS INTEREST?	C
GAME DEPTH	C	GRAPHICS	C	VALUE FOR MONEY	C+

In *Worms* you capture territory while programming artificial intelligence. One to four people can play against any or all computer-controlled opponents. Initially, you see colorful abstract patterns as the worms begin to move, leaving behind a trail of lines. You train them by pointing them in the desired direction and pressing the joystick. You often need to do this several times at first until they realize that you want them to continue until they can't go any further in the chosen direction. The lines they leave behind box off territory for you. The program lets you choose smart or randomly generated worms as opponents. You can train your worm each time, or use the worm from your last game.

The instructions advise you to put off reading the documentation indefinitely and just play the game. Reading the instructions may not clarify play, so they may have a point. I found the game interesting and graphically unusual, but it does take a long time to learn.

LOST COLONY

Company: Acorn Software
Language: Atari BASIC
Hardware Requirements: 40K, Disk

Department: Entertainment
Sugg. Retail: \$29.95
Availability: 4
Disk or Tape: Disk

OVERALL RATING	C+	EASE OF USE	C	ERROR HANDLING	B-
GAME CONCEPT	B-	SKILL INVOLVED	B+	DOCUMENTATION	B-
CREATIVITY	C+	CHALLENGE	B	HOLOS INTEREST?	C
GAME DEPTH	B-	GRAPHICS	C	VALUE FOR MONEY	C

Back in the days when computer games were written in BASIC for large timesharing systems, most computer folk were familiar with a game known as *Kingdom*. This game, which was also known by the names *Sumer* and *Hammurabi*, was a rather simple-minded simulation of an agricultural society. The object was to allocate a limited number of resources in order to feed your people, and, in some versions, maintain an army to protect your borders from invasion. Rule wisely, and your nation would expand and prosper. An inept monarch would be forced to sell off land in order to buy food, and would eventually be removed from office by his subjects.

Lost Colony is a modern industrial version of *Kingdom*. You are the administrator of Warren's World, mankind's first attempt at colonizing another planet. Thanks to a major global war back on Earth, your world has been left to go it alone. Your job is to divide available raw materials, manpower, and production facilities among a number of industries which are necessary to the survival of your colony. Your goal is to keep your population well fed and happy (the latter being related to the number of consumer goods you produce and allocate).

During each game turn, you determine how your resources will be used for the upcoming year. By assigning sufficient manpower, raw materials, and production facilities to each of your necessary industries (farming, manufacturing, mining, transportation, and energy), you determine the success of future production. One year of bad planning may damage your colony's prosperity for many years to come.

This is a complex simulation, which is made even more difficult by the lack of information in the documentation. While all of the commands and options are described in detail, only the most meager of guidelines are offered on which to base your decisions. For example, you are given a chart listing the amounts of consumer goods needed for your people — a very useful piece of information. Equally useful would have been such information concerning the number of farm workers required to produce enough food for a given number of people. Without this last item, you may find yourself starving most of your subjects in the first year. This makes for a very short game.

There is a limited use of graphics here, and no use of sound. Some versions contain a built-in calculator, an invaluable tool in this game. Sadly, the Atari version does not contain this feature. Even more valuable would have been some form of printer support, which would enable you to learn from your mistakes.

Still, if economic concepts make your pulse race, and the thought of guiding the destiny of the masses excites you, there is a good chance that you will enjoy taking control of *Lost Colony*.

BLOCK BUSTER

Company: Quality Software

Language: QS FORTH

Hardware Requirements: 32K; disk drive or cassette player.

Department: Entertainment

Sugg. Retail: \$15.95

Availability: 7

Disk or Tape: Both

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

B
B
C
C

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

B+
C
B
B+

ERROR HANDLING
DOCUMENTATION
HOLDS INTEREST
VALUE FOR MONEY

B
B
C+
B

Block Buster is a program that can help you solve the mixed-up Rubick's Cube that has been hiding in your desk drawer these last couple of months. Or, if you would like to solve a scrambled cube on screen, the computer will time your effort and keep track of the number of moves. The program is a good one in that it is the first to show the hidden three sides as an "exploded view" in the form of a mirror reflection. Other programs have always resorted to flipping the cube over to uncover the missing faces. The cube faces here are shown in six Hi-Res colors using a special display technique that makes the colors appear as if they are vibrating.

The program is very easy to use. Input can be by paddle, yellow console keys, or keyboard. The paddle and console keys move an arrow around the three front faces of the cube. Depressing the button or Start key briefly rotates the section of the cube 90 degrees. Direction can be changed by holding down the button or start key longer. Keyboard commands are a little more difficult since they require you to learn the notation devised in Douglas Hofstadter's article published in *Scientific American* called "Metamagical Themes." No matter which input system you use, the moves are displayed in that notation in a scrolling set of command lines at the bottom of the screen. This information can be sent to the line printer — a very helpful addition if you need the solution to your cube, and you don't wish to follow the on-screen solution a step at a time.

Inputting a cube to solve is easy. A movable cursor shows the current block position, and the color is toggled by paddle button or console keys. The program checks to see if the cube is legal before proceeding with a solution. A set algorithm (clearly outlined in the documentation) solves the cube. The program makes no attempt to determine if a cube has been rotated before proceeding with a solution. A typical solution of a cube scrambled twice took 236 moves in 4 minutes, 26 seconds. Speed isn't a concern because the computer could have solved it in 15 seconds if the display was off. The program can also solve two alternate patterns: the Checkers pattern and the Christmas Cross.

Rubik's Cube fans will like this program. Certainly users could work a cube on screen, but most will use it to solve scrambled cubes. I personally think it is more satisfying to manipulate a physical cube in your hands than on a TV screen (and it might be cheaper, too).

SUPER CUBES and SLIP

Company: Thorn EMI

Language: Assembly

Hardware Requirements: 16K, cassette player.

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 3

Disk or Tape: Tape

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

D
C
D
D

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

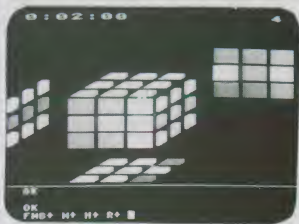
B
C+
B
C

ERROR HANDLING
DOCUMENTATION
HOLDS INTEREST?
VALUE FOR MONEY

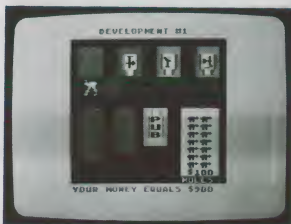
N/A
C-
D
D

Super Cubes and Slip is a package containing two separate programs. *Super Cubes* is a puzzle game, very similar to Rubik's cube except that the cube can vary from two blocks wide to four blocks wide. Once you choose the level of difficulty, the computer begins to scramble the cube. The object is for you to unscramble the cube by rotating the blocks on each side back to their original solid colors. Input is through the joystick. Moving the stick up and down moves an arrow to the appropriate layer to be moved, and moving the stick sideways makes the move. Pressing the joystick button turns the cube over to show the bottom three sides. This game is a puzzle for the user to solve, and will not solve cubes for you. While it might be an interesting diversion, manipulating a physical cube in your hand is more satisfying.

Slip is the old game of *Tilt*, in which you have to roll five balls into their appropriate holes by tilting a board on which they roll around. The board also has maze-like passages for added challenge. The computer version has various degrees of difficulty, timing your game until you succeed in putting them in their proper places. The notches are not very deep, so that tilting the board too much causes them to move out of their holes. The games are not worth more than several plays.



BLOCK BUSTER



M.U.L.E.

M.U.L.E.

Company: Electronic Arts

Language: Machine

Hardware Requirements: 48K

Department: Entertainment

Sugg. Retail: \$40.00

Availability: 8

Disk or Tape: Disk*

OVERALL RATING

A

CONTROLLABILITY

A

ERROR HANDLING

N/A

GAME CONCEPT

A

SKILL INVOLVED

B

DOCUMENTATION

B+

CREATIVITY

B+

CHALLENGE

B

HOLOS INTEREST?

A

GAME DEPTH

A-

GRAPHICS

B

VALUE FOR MONEY

A

Basically a strategy game, *M.U.L.E.* combines some of the best competitive features of *Monopoly* with economic simulation games like *Kingdom*. Four people can play, or you can play against three computer opponents. As a colonist from a distant planet, your object is to help the colony become self-sufficient in farming, mining, and energy production. To help you with your work, you can buy a M.U.L.E. (multiple-use labor element) at the local store, equip it, and walk it back to your land. During turns (six in the beginner's game, twelve in the regular game), each player chooses or buys at auction one of forty-four plots of land. You produce what you wish for that turn, based on how much food and energy you have. Random events sometimes influence the results. At the end of the month, you can buy or sell goods at an auction, based on whether you face a shortage or surplus. The auction follows the laws of supply and demand and becomes the best part of the game because of its cutthroat nature. For example, miners of Smithore earn a great deal but also pay dearly for their consumption of energy and food. Buyers and sellers control prices by moving their bid and ask lines. When a match results, a transaction takes place. I enjoyed watching players scramble for limited supplies, but you can't get too greedy because the survival of the entire colony is at stake. At the end of the auction, players receive status reports telling who leads.

The game teaches valuable lessons in economics in a fun way. You not only learn the theory of supply and demand, but also that increased size leads to increased production, and increased knowledge leads to increased efficiency. You also observe the law of diminishing returns as you try to establish a monopoly. If you look out only for yourself, the poorer players can't afford to buy the energy and food that you produce.

Random events also influence the game. Planetquakes halve mining production, space pirates steal Smithore, your M.U.L.E. might run away, the general store may burn down, acid rain can lower food production, and hoarded food spoils. You may even go Wumpus hunting after outfitting your M.U.L.E. If you can catch a Wumpus when he opens his cave door and shines his light, you can hold him for ransom.

The game offers three levels of play. The beginner's level avoids some advanced features and is short lived. The regular game introduces land auctions, minimum production requirements, and land development. The tournament level adds the chance to prospect rare Crystite and lets you form cartels. All three are extremely well designed and rival the best of the board games. You can easily play using only a joystick. The graphics are colorful and nicely animated, and even the music is good, with original, toe-tapping tunes. When several people play, the game becomes involved and interactive.

CROSSWORD MAGIC 2.0

Company: HLS Duplications

Language: Machine Language

Hardware Requirements: 40K, disk drive.

Department: Entertainment

Sugg. Retail: \$49.95

Availability: 5

Disk or Tape: Disk*

OVERALL RATING

A

GAME CONCEPT

B

CREATIVITY

B

GAME DEPTH

N/A

EASE OF USE

SKILL INVOLVED

CHALLENGE

GRAPHICS

A

N/A

N/A

B+

ERROR HANDLING

DOCUMENTATION

HOLDS INTEREST?

VALUE FOR MONEY

A-

B+

A-

B+

Crossword Magic 2.0 presents a fun way to create crossword puzzles. The puzzles that it creates from lists of words that you provide are of the British format, rather than the kind you are used to working in newspaper columns. These puzzles, lacking a tight interlocking symmetrical form, have many more black spaces because the words, although interconnected, are more strung out. The puzzle can range in size from a 3x3 square to a 20x20 square.

The package consists of a double sided disk: a maker program on one side and a player disk on the other. The process of making a puzzle is both interactive and creative. You can arbitrarily choose a theme, enter words one at a time, and watch the computer instantly insert the word in the puzzle. The puzzle can be a fixed size, or can be expanded to fit in new words. If the computer cannot use the word immediately, it stores the word for later use. Because the process is interactive, you can choose words as you go, either to connect to the chain of linked words or to bridge a gap. The computer is quite capable of filling in the letters for SPAN if the P and A were missing, or the P and N were missing. There is no guarantee, however, that the computer won't decide that SPAN should cross the word EGRESS instead. In this latest version, you can press the R key to Reposition the word for another possible fit, if one is available. You may also delete the last word should you make a mistake.

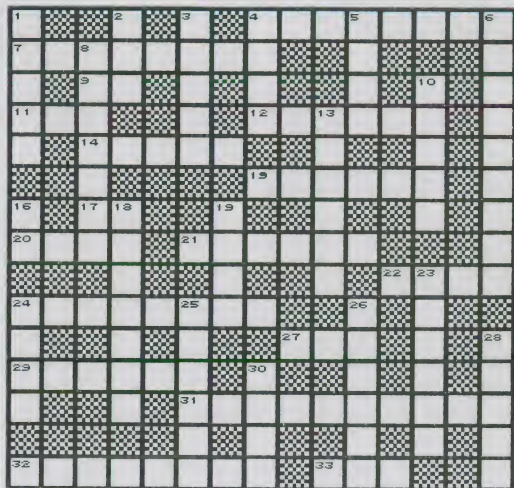
After you have inserted all the words in the puzzle, it's clue time. This is where children have the most fun. You may dream up strange or humorous clues, limited only by your imagination. When the clues are finished, the computer will step through them, enabling you to edit any errors.

Puzzles can be saved to either the maker disk, or to any other formatted storage disk for later play. They can also be dumped to any printer (supports 30 printers and 14 interface cards) that has graphics capabilities. The printout contains the blank puzzle, with clues listed below and the answers at the very bottom. The answers can be clipped before distributing for player solution.

The player disk allows you to solve a puzzle. Puzzles are first transferred to this disk from the master disk. You use the arrow keys for movement over the crossword pattern; the space bar toggles the direction. When the cursor is on any black or filled-in square, the clue is displayed. You can type the answers in, or correct any mistakes. The computer will keep track of your errors. If you finish, or choose to peek at a solution, the correct answer will be identified with inverse lettering, with the errors in normal lettering.

Crossword Magic is exceptionally easy to use, fast and suitable for both home and educational application of all levels; it seems particularly useful for children who rebel at any program which teaches verbal skills. The documentation includes a large section of tips and techniques for forming better puzzles. The program provides an attractive display and user interface, and without doubt is the best crossword puzzle program available. Considering the difficulty of the algorithm, it is an amazing feat in programming.

```
A  A  A  CREATIVE
C  O  M  P  U  T  E  R  N  L
O  A  T  A  O  N  A  I
R  U  N  A  W  I  Z  A  R  D  M
N  A  N  T  I  C  I  D  I
    G  U  M  P  I  R  E  N
I  E  T  T  P  R  A
T  Y  R  O  T  A  R  G  E  T  T
    A  L  R  O  G  R  E
J  O  Y  S  T  I  C  K  S  O
E  I  N  S  E  E  B  S
F  A  M  O  U  S  K  A  L  T
F  N  U  N  I  V  E  R  S  I  T  Y
    A  S  C  N  L
P  R  O  G  R  E  S  S  S  H  E  E
```

ACROSS CLUES

4. ORIGINATIVE
7. CALCULATOR
9. PREPOSITION
11. MOVE SWIFTLY
12. SORCERER
14. GRAPHICS CHIP
15. ARBITRATE
17. VCS CARTRIDGE
20. NOVICE
21. GOAL
22. MONSTER
24. CONTROL STICK
27. LOOK
29. RENOWNED
31. INSTITUTE OF LEARNING
32. ADVANCEMENT
33. PRONOUN

DOWN CLUES

1. OAK SEED
2. INCLINED
3. COMPUTER
4. BLACK BIRD
5. MONEY IN INDIA
6. REMOVE
8. BUSINESS LEADER
10. SNAKE
13. METAL FASTENER
16. INDEFINITE PRONOUN
18. ACT OF TWISTING
19. SOFT STONE
23. HAS BLACK BLOOD
24. EDITOR'S NICKNAME
25. GUARANTEE
26. SEEK
28. TYPE
30. TOUCH WITH LIPS

RICOCHET

Company: Automated Simulations
Language: Machine Language
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: \$30.00
Availability: 7
Disk or Tape: Disk*

OVERALL RATING	B-	CONTROLLABILITY	B	ERROR HANDLING	B
GAME CONCEPT	B	SKILL INVOLVED	B	DOCUMENTATION	B-
CREATIVITY	B-	CHALLENGE	B+	VALUE FOR MONEY	B
GAME DEPTH	C	GRAPHICS	C+	HOLOS INTEREST?	C+

Ricochet somewhat resembles bumper pool played by two players or one player against the computer on a frictionless table. Each opponent has two-five shot launchers set in each corner. There are also two bumpers, or goals, set midway between them, and six deflectors initially positioned in a triangle to guard the player's goal. The entire field is gridded to make calculations easier.

A player has the choice of launching a ball, or rearranging his defensive deflectors. During rearrangement, all deflectors must be moved in the same direction for that turn. When a ball is launched it travels until it either reaches the playfield boundary, or strikes a deflector and flips it from one orientation to another. In each case the ball ricochets at a 90 degree angle and continues until it leaves the playfield at the left or right sides. When the ball strikes a launcher, that launcher is put out of commission for two turns.

Points are scored for striking bumpers, launchers, and deflectors of either player. The game ends when the player runs out of launcher balls. A match consists of a group of games. What is interesting is the handicapping that the computer does to even out the match. At the conclusion of a game in a match, the bumpers on the winner's side of the board increase in value, thus the next game is easier for the loser. The average match takes between ten and thirty minutes, and in addition, a clock is used to penalize players who take too much time in choosing their moves.

The game has a number of variations including extra bonus targets. In all there are five variations with the fifth lacking the customary grid. While the game at first appears to the novice to be a game of random luck, like chess this game requires the ability to think and plan moves far ahead. The ricochets can be predicted, although they are difficult for the average player to visualize after several bounces, especially when deflectors shift orientation from vertical to horizontal. Like most strategy games, *Ricochet* requires a lot of experience, and skilled players will find it a real challenge.

MATCHBOXES

Company: Broderbund Software
Language: Machine
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: \$29.95
Availability: 8
Disk or Tape: Disk*

OVERALL RATING	B-	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C+	SKILL INVOLVED	B-	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	B-	HOLOS INTEREST?	C+
GAME DEPTH	C+	GRAPHICS	B	VALUE FOR MONEY	B-

Matchboxes is a nicely animated and tuneful version of the classic T.V. game *Concentration*. This version has features of the *Concentration* game and several others that require the players to guess the scrambled word hidden behind the blocks.

You are presented with a rectangular grid of thirty-six blank numbered boxes. Each of the boxes conceals a nicely animated figure and a fragment of a familiar tune such as "Old MacDonald Had a Farm." A duplicate match appears elsewhere in the grid and your job is to find it. Players use joysticks and fire buttons to uncover two boxes at a time, trying to match the identical pairs. A saying or message is also hidden behind the grid and the player who makes out the entire phrase wins the game.

All of these versions can be played against a computer opponent at one of three levels. Naturally, the computer has a very good memory, but at the beginner's level it deliberately misses matches. You get the feeling that the computer is toying with you each time it misses a match. This soon disappears on the upper levels where the computer becomes a more formidable opponent.

The game is ideally suited for family play, especially for those with young children, but in all cases *Matchboxes* is best played against a human partner. The animation is nicely done, and there are good animated sequences of jumping kangaroos, blasting rockets, moving abstract shapes, and a Pac-Man scenario. This, accompanied by familiar tunes, will hold a child's as well as an adult's attention for a long while.

SCRAM

Company: Atari

Language: Atari BASIC

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$24.95

Availability: 7

Disk or Tape: Tape

OVERALL RATING

A

GAME CONCEPT

A

CREATIVITY

A

GAME DEPTH

A

CONTROLLABILITY

B-

SKILL INVOLVED

B+

CHALLENGE

A

GRAPHICS

A+

ERROR HANDLING

A

DOCUMENTATION

A+

HOLDS INTEREST?

B

VALUE FOR MONEY

A

Scram is a nuclear power plant simulation. Excellent use is made of character graphics to show fluid motion in the three main cooling loops in a nuclear power plant. The temperature at various points in each loop is displayed on the screen. You control valves, pumps, and the reactor control rods by means of a single joystick. As you open and close valves, or turn pumps on and off, you see the effects as the temperatures change in the cooling loops. You can even melt the reactor core, resulting in a brilliant color display. Experience gained in operating the system provides an intelligent understanding of the workings of such a plant.

After you are thoroughly familiar with the functions of the various pumps and valves, you can test your skill in the game mode. You set a risk level from 1 to 9. The risk level sets the frequency at which earthquakes occur. Each earthquake damages a component in the system. From the temperature changes that occur, you must locate the damaged part. You then send work crews to fix it. You have a limited number of work crews, and earthquakes can occur frequently at the higher risk levels. The only minor flaw in the program is a slow response when you move the cursor around the screen to work the valves and pumps.

The documentation is excellent. It describes the program and the operation of a nuclear power plant. Not only is this a first rate simulation, but it also makes excellent use of computer graphics to teach a complex subject.

CONTROLLER

Company: Avalon Hill

Language: Machine

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$30.00

Availability: 5

Disk or Tape: Disk

OVERALL RATING

B

GAME CONCEPT

B

CREATIVITY

C

GAME DEPTH

C

EASE OF USE

B

SKILL INVOLVED

C

CHALLENGE

B-

GRAPHICS

B-

ERROR HANDLING

B

DOCUMENTATION

C

HOLDS INTEREST

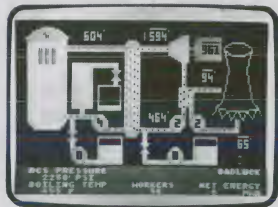
B

VALUE FOR MONEY

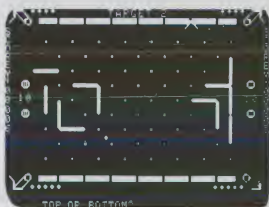
C+

This game is well suited to the novice controller. In it, you have the choice of controlling either one or all eight of the available aircraft. After choosing the number and type of aircraft, you are greeted by a status board of all eight craft, and a graphic display of the aircraft and surrounding area. You are able to switch between a ten or one hundred mile radius display, with the status board listing the aircraft, direction of flight, altitude, and airspeed. The amount of fuel left is also displayed at the bottom of the screen, along with any commands you may have given up to that point. Screen command display is a real plus in this game.

Play one or two games with a single aircraft before venturing to multiple aircraft control — that's where the real controllers are separated from the private pilots.



SCRAM



RICOCHET

EVEREST EXPLORER

Company: Acorn Software Products

Language: Atari BASIC

Hardware Requirements: 40K

Department: Entertainment

Sugg. Retail: \$19.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING	D+	CONTROLLABILITY	C-	ERROR HANDLING	N/A
GAME CONCEPT	C+	SKILL INVOLVED	B-	DOCUMENTATION	B-
CREATIVITY	C-	CHALLENGE	B+	HOLDS INTEREST?	D+
GAME DEPTH	C	GRAPHICS	D+	VALUE FOR MONEY	D+

Everest Explorer places the player in the middle of a climb up the tallest mountain in the world, Mt. Everest. Imagine yourself battling nature at its most savage in this primal challenge of man against his environment.

Keep imagining. *Everest Explorer* does not simulate a mountain climb. Instead, it simulates the logistics of a climb: the number of climbers and Sherpas, their equipment, and each individual's assignments. You must decide on the number of tents, oxygen tanks, and quantity of food and fuel to carry, as well as how to apportion them among the various camps set up along the climb route.

This program is available in versions for a number of different computers. As a result, it does not take advantage of a specific computer's unique capabilities. Don't expect graphics or sound in this game. It does make use of a joystick or paddle for most data entry requests, with the keyboard used for the remaining inputs. The use of joystick/paddle only serves to complicate data input.

As with *Lost Colony*, *Everest Explorer* is likely to appeal to a limited subset of computer gamers. Those who enjoy juggling large numbers of variables (and who don't get enough of that sort of thing at work) may get a sense of satisfaction out of this game. The rest may want to skip it.

VAULTS OF ZURICH

Company: Artworx

Language: BASIC

Hardware Requirements: 32K disk, 24K cassette

Department: Entertainment

Sugg. Retail: \$24.95 cassette & Disk

Availability: 3

Disk or Tape: Both

OVERALL RATING	B	CONTROLLABILITY	B	ERROR HANDLING	B
GAME CONCEPT	B	SKILL INVOLVED	C+	DOCUMENTATION	C+
CREATIVITY	C+	CHALLENGE	B	HOLDS INTEREST?	B
GAME DEPTH	B	GRAPHICS	C-	VALUE FOR MONEY	B

Vaults of Zurich is a well-conceived, nine level strategy maze game. The object is to enter a powerful banking institution (a place where the rich and powerful deposit their wealth in secrecy), and penetrate its defenses to the innermost sanctum of the chairman's office in order to rob him. You, playing the master thief, face a difficult challenge: the bank is protected by a formidable security system of armed guards and hidden TV cameras.

The strategy to winning this game is to collect a following of fellow thieves from among the tourist and bank employees who are in each of the vaults that you encounter on each particular floor. Since you can't just enter a vault and abscond with the securities without dealing with the characters there, you must either attempt to bribe them into joining you, or fight with them. Once you gain control of the vault, you are entitled to the treasure and may take any tools you find. These tools consist of explosives, drills, keys, maps, and wires for disabling the TV cameras.

A combination of joystick control and keyboard commands are used in this game. The joystick guides the thief through the maze. Keyboard commands such as FI for fight, TA for take, and DR for drill are used when appropriate. There are stairways between levels which can be used by pressing the joystick button. The location of these unguarded stairways is important, for if you trip the alarm, you have only twenty-five seconds to elude the guards by changing levels. In your hurry, you often drop tools and loot. Obviously, the lower levels are more difficult; although the guards are easy to beat on upper levels, it is safer to attempt to sneak past them on levels four through nine.

You have exactly two hours to reach your objective: the chairman's office on level nine — and it's guarded by four vault doors. You'll have to drill when your keys don't work, and that takes time. If you successfully defeat anyone who might be lurking in his office, you still must escape past nine levels of guards before the clock runs out.

Vault of Zurich is a very challenging and fun game to play. The maze is different each time you enter in, so it doesn't become boring after repeated tries. The graphics, a combination of text characters and maze walls, are adequate. I'd say it's a very well designed game.

CLIPPER

Company: Program Design, Inc.

Language: Atari BASIC

Hardware Requirements: 32K tape, 32K disk

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 5

Disk or Tape: Both

OVERALL RATING	C+	CONTROLLABILITY	B-	ERROR HANDLING	N/A
GAME CONCEPT	B-	SKILL INVOLVED	B	DOCUMENTATION	B
CREATIVITY	B	CHALLENGE	B	HOLOS INTEREST?	C
GAME DEPTH	B+	GRAPHICS	C-	VALUE FOR MONEY	B-

Clipper places you in command of a nineteenth-century sailing ship. Your objective is to travel from New York to San Francisco in the shortest possible time. You begin by selecting your vessel, deciding the weight of cargo you will carry, the number of crewmen you will command, and the provisions you will take.

Having loaded your ship, it is time to set sail. The screen displays your position (also available on a world map display), the ship's heading and speed, the wind direction and speed, and the amount of sail you are presenting to the wind. Aside from the mathematical problem of adjusting your heading to the direction of the wind, you must be aware of weather conditions, underwater hazards such as reefs, and morale problems with the crew.

One aspect of *Clipper* is sufficiently unusual to be worthy of mention. Both the disk and cassette versions make use of the cassette recorder during play. At various moments during the game a wise old sea captain will come on to tell of his experiences. Aside from the value of the information imparted by the captain, he adds an element of authenticity to this enterprise.

Clipper is a relatively slow-moving game and is not likely to appeal to those who are ruled by their reflexes. Its graphics are far from spectacular, and the response is as slow as one might expect from a BASIC program. Still, there is a place in the market for an innovative simulation game. For those who want an intellectual challenge, *Clipper* may be just the ticket.

WORD WIZ

Company: The Programmer's Workshop

Language: BASIC

Hardware Requirements: 24K

Department: Entertainment

Sugg. Retail: \$9.95

Availability: 5

Disk or Tape: Both

OVERALL RATING	B	CONTROLLABILITY	C	ERROR HANDLING	B
GAME CONCEPT	B	SKILL INVOLVED	B	DOCUMENTATION	B
CREATIVITY	C-	CHALLENGE	B	HOLOS INTEREST?	B
GAME DEPTH	A-	GRAPHICS	D+	VALUE FOR MONEY	A-

Word Wiz, a word definition game, can be played by one to four players. The game plays much like hangman, with players guessing letters in a word one at a time. The guessing continues until either the word is formed or a time limit elapses. The screen shows a grid of the alphabet on the upper left, a box containing a brief definition of a word on the upper right, and a series of boxes corresponding to the number of letters in the word in the middle. Current scoring for each player appears in the lower portion of the screen.

The sound and graphics are the very simple, no-frills variety. The definitions and words presented range from moderate to quite difficult. The number of different words on the disk is large (over one thousand) and the game can be played for hours without repeating a word. The player is not supplied with the correct answer if words are missed.

The biggest fault with the program lies in the awkward way that you must stop playing the game. After the game ends, you are asked if you wish to play another game or not. You must answer "N" for no to stop playing. If you fail to do this or if you decide to stop playing before the end of the game, the same words and definitions will repeat next time. This is extremely annoying for those of us who start a game but often get interrupted in the middle. In general, *Word Wiz* is a good game with reasonable depth.

Music

MUSIC COMPOSER

Company: Atari

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$39.95

Availability: 9

Disk or Tape: Cartridge

OVERALL RATING **B**
CONCEPT **B**
CREATIVITY **B+**

EASE OF USE **B+**
GRAPHICS **A-**
ERROR HANDLING **B**

DOCUMENTATION **A-**
HOLDS INTEREST **B**
VALUE FOR MONEY **B-**

Atari's *Music Composer* is a ROM cartridge program designed to help you create and play music through Atari's built-in sound generating hardware. Notes are entered at the keyboard in the order: key, sharp or flat, octave, length of note. (So the form FS3Q would mean F sharp, octave 3, a quarter note.) The program covers a three octave range. Notes in the current measure are displayed on the screen using standard musical notation, and are played through the speaker on your television or monitor.

The user enters notes into one of ten phrases. Each of the four voices is assigned some combination of phrases to play. When setting up this voice information, the user can control volume, repeat a phrase, or transpose the phrase a specified number of half steps up or down. When the Listen option is selected, each of the four voices plays whatever phrases were selected for it. In addition, those notes being played by one of the voices are displayed on the screen. The sound quality is that of an inexpensive organ (although the use of three and four note chords can produce some rather impressive effects).

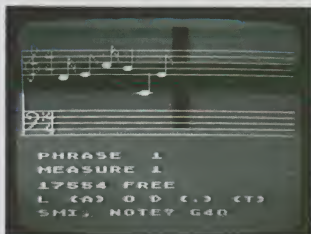
Phrases, voice information, or entire compositions can be saved to cassette or diskette. The documentation gives a detailed description of the data storage format, which makes it possible to manipulate music files with a BASIC or assembly program.

There are some problems with *Music Composer*, however. The tempo and volume adjustments are extremely coarse. One would wish for a greater degree of control here. In addition, tripled notes are not supported. This means that the user must generate a complex combination of tied notes to produce the same result. Also, there is no facility for copying all or part of a phrase. If two verses of a song are nearly identical, the user must manually duplicate the phrase. (This is one of the places where a short BASIC program can save a great deal of time.) Nor is there a way to play part of a composition. This makes correcting mistakes a much more time-consuming operation than it needs to be.

In addition to missing features, there are a few annoying bugs. The Check Measure routine, which prevents the user from entering a measure with an incorrect number of beats, does not always catch errors when the notes are initially entered. It's a good idea to run through the measures a second time. A second problem concerns measure deletion. When you delete the last note in a measure, the measure is deleted and all of the higher numbered measures are moved down one position. Unfortunately, the current measure number is incremented, which causes you to skip a measure. (For example, if you are on measure 42 and delete all of its notes, measure 43 becomes measure 42 in its place, 44 becomes 43, and so on. You are then sitting on new measure 43, which used to be measure 44. You will have skipped old measure 43.) If you need to delete a group of measures, be very careful, and keep a copy of the unmodified composition, just in case.

My biggest complaint concerns the diskette load routine, which is painfully slow. *Music Composer* can take several seconds to load each disk sector. A composition of twenty or more sectors may take nearly as much time to load as it does to play.

Despite these problems, *Music Composer* is well worth owning. It can be a great deal of fun to use. Its low memory requirements permit even the smallest system to play complex tunes. It's also a great way to impress those people who aren't excited by computer games.



MUSIC COMPOSER

ADVANCED MUSICSYSTEM

Company: Atari Program Exchange

Language: Atari BASIC & Machine

Hardware Requirements: 32K, disk drive

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING	A	EASE OF USE	A -	DOCUMENTATION	B +
CONCEPT	B +	GRAPHICS	B -	HOLDS INTEREST	A -
CREATIVITY	A -	ERROR HANDLING	A	VALUE FOR MONEY	A +

Advanced MusicSystem is a program for music generation. The user enters the notes to be played by each of the Atari's four voices, including volume information. The program remembers and displays the duration, octave, and volume of the last note entered. These values are used as the default settings for the next note you enter. This means that you enter new values for these settings only when a change is desired. Track is kept of the number of beats used in the current measure which are too short or too long.

The *Advanced MusicSystem* permits notes over a range of five and a half octaves. It also has a copy feature, which permits the duplication of previously entered notes or measures. In addition, it supports direct entry of most types of musical notation. It permits the user to indicate notes to be emphasized, and is at present the only system for the Atari which allows you to specify tripled notes.

The playback mode permits the playing of any group of measures by any combination of voices. During playback, the screen displays a piano keyboard. Each voice is assigned a color; and when a note is played by a particular voice, the key corresponding to that note takes the voice's color. This has the advantage of letting you see as well as hear what all four voices are doing. You can even use a paddle to vary the tempo of a piece while you are playing it.

The program is supplied with five sample Classical pieces. All are good demonstrations of the power of this system, which produces the most pleasing sound I have heard come out of an Atari computer. The documentation is both understandable and complete. But of course it does assume the user is reasonably familiar with musical notation and has some knowledge of musical theory.

The only complaint I have with this program concerns the speed of the note entry routine. Since this part of the system was written in Atari BASIC, and has a fair amount of validation and processing to perform, the response time is poor. To avoid problems with lost notes, the *Advanced MusicSystem* produces a clicking sound on the internal speaker when it is ready for another note. As long as you wait for this sound before typing, you should have no problems.

This is without question the best music package for the Atari home computer. With its wealth of features and the high quality of its sound, it is an excellent value. Highly recommended.

THE DRUMESISER

Company: Sar-An Computer Products

Language: Machine

Hardware Requirements: 16K

Department: Entertainment

Sugg. Retail: \$49.95

Availability: 2

Disk or Tape: Cartridge

OVERALL RATING **C**
EASE OF USE **B**
VENDOR SUPPORT **C-**

DOCUMENTATION **D**
VISUAL APPEAL **C**
ERROR HANDLING **B**

RELIABILITY **B-**
USEFULNESS **D**
VALUE FOR MONEY **D**

The Drumesiser employs the Atari computer's four-tone generators (voices) to simulate different percussion instruments. Its Tune function lets you assign the pitch, volume, sustain, decay, and distortion values for each instrument, as well as the voice for each. You can define sixteen instruments at once, and store different sets of instrument definitions on disk or cassette. After using the Tune function, you play the instruments you have defined. Each definition includes a pair of keyboard characters to activate the associated instrument. Pressing either key causes the instrument to play, while pressing the two keys alternately produces a sort of drum roll. You can also play the instruments by using the joystick ports. A joystick in the first port plays the first four instruments, each direction (forward, back, right, and left) calling forth an instrument. The second, third, and fourth ports operate the remaining voices. (Owners of Atari XL computers can only play eight instruments this way because these models have only two joystick ports.) If you wire a set of pressure-sensitive panels to the joystick ports, you can play the synthesized drums with a pair of real drumsticks.

This program presents a number of problems. Using the keyboard makes it difficult to generate anything that sounds like real drums, but the documentation doesn't tell you whether the joystick ports produce more realistic sounds. The instruction booklet does little more than describe the options available. Although it mentions the possibility of adding external devices, it does not tell you what devices are available, where to find them, or what they cost. The worst drawback of the program is that it does nothing for you which a simple BASIC program could not do just as easily and more cheaply. At twenty dollars, this program would be expensive; at fifty, it's a joke.

PLAYER PIANO

Company: Atari Program Exchange

Language: Atari BASIC

Hardware Requirements: 24K [cassette]
40K [diskette]

Department: Entertainment

Sugg. Retail: \$24.95

Availability: 5

Disk or Tape: Both

OVERALL RATING **D**
CONCEPT **C**
CREATIVITY **C**

EASE OF USE **C**
GRAPHICS **D**
ERROR HANDLING **B-**

DOCUMENTATION **B**
HOLDS INTEREST **F**
VALUE FOR MONEY **C-**

Player Piano turns an Atari computer into a very simple piano. A picture of a truncated piano keyboard is drawn on the screen. Above each white key is the name of the corresponding note; below each black and white key is the letter or symbol on the computer keyboard which will produce that tone.

The program may be used in either of two modes. In its standard piano mode, each key you strike will generate a tone. This tone will be held until you hit the next key, which gives you the ability to "play" your computer, one note at a time.

The second mode permits tunes to be saved, and then played. You enter a note as above, and then enter a duration for that note. This duration is in terms of some internal time, which means that a change to the tempo of a tune requires a re-entry of every note.

Note that editing is possible but difficult. Deletion of a note is not possible, nor is insertion into the middle of a composition. The note change routine is not designed to change more than one note at a time. There is no command to clear memory in order to start a new tune.

The limitations of *Player Piano* are common to both modes. The user is limited to a single voice playing one note at a time. No attempt has been made to manipulate the tone generated by the Atari, which tends to be rather harsh. There is no facility for adjusting the volume. The graphics, which consist of the aforementioned keyboard and a treble clef which marks the note being played, are very uninteresting.

The disk version contains two sample songs: "Happy Birthday" and "Take Me Out To The Ball Game." Either one clearly shows the limitations of this program.

NAME THAT SONG

Company: Quality Software

Language: Atari BASIC

Hardware Requirements: 24k disk; 16K cassette

Department: Entertainment

Sugg. Retail: \$17.95 disk / \$14.95 cassette

Availability: 7

Disk or Tape: Both

OVERALL RATING	C -	CONTROLLABILITY	B	ERROR HANDLING	C
GAME CONCEPT	C	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	C	HOLDS INTEREST?	C -
GAME DEPTH	C -	GRAPHICS	D	VALUE FOR MONEY	D

Name That Song is a two-player version of the television game show by the same name. In it, two players attempt to score points by identifying songs played by the computer. The first one to signal the program by pressing his joystick button (or a key on the keyboard), has the opportunity to name that song. The smaller the number of notes played before someone signals, the greater the number of points received. The first player to reach 50, 75, or 100 points (specified at the start of the game) wins.

There are two modes of play. The first requires that the title of the song be typed. You can take no liberties in the way you enter the title. Typing "Roll out the Barrel" instead of "Beer Barrel Polka," or "My Bonnie Lies over the Ocean" instead of "My Bonnie," will not get you any points. In the second mode, as soon as one of the players has signaled, four song titles are displayed on the screen. Select the correct title with joystick or keyboard to score.

Nothing about *Name That Song* is particularly novel or interesting. The music is generated using a single voice synthesizer, which gives it a harsh and unattractive sound. The display contains a limited amount of text, with no graphics to add life or interest. It's the sort of program that would have held more merit at a time when high quality software for the Atari was less prevalent than is the case today.

JUKEBOX #1

Company: APX

Language: BASIC

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$17.95

Availability: 5

Disk or Tape: Disk

OVERALL RATING	A	EASE OF USE	A -	DOCUMENTATION	B +
CONCEPT	B +	GRAPHICS	B -	HOLDS INTEREST	A -
CREATIVITY	A -	ERROR HANDLING	A	VALUE FOR MONEY	A +

The Advanced Music System has become a showpiece of musical virtuosity. The author has now created a disk version that can play several classical selections. *Jukebox #1* contains eight classical pieces from such masters as Bach, Beethoven, and Tchaikovsky. Each of the pieces can be selected from an option menu, and graphically displayed on a five and one-half octave piano keyboard. Four colors, each corresponding to the Atari's four voices on the sound chip, indicate the notes.

The following musical selections are offered on this disk: *Overture to the Nutcracker*, by Tchaikovsky; *Flight of the Bumblebee*, by Rimski-Korsakov; *String Quartet in Eb*, by Mozart; *Brandenburg Concerto #5 in D*, *Well Tempered Clavier*, *Air on a G-String*, and *Fugue in C Minor*, by J. S. Bach; and *Fur Elise*, by Beethoven. Each can be played separately, or the entire collection can be played successively in the jukebox mode. The tempo can also be varied by paddle input.

The sound and graphics in this package are excellent. The selections were input using the Advanced Music System. It is obvious from listening to his error free pieces that the author is an expert in classical music. NOTE: The musical selections in this package cannot be modified by the Advanced Music System because the author used data compression techniques to squeeze this many selections onto disk.

Miscellaneous Entertainment

PERSONAL FITNESS PROGRAM

Company: APX

Language: Atari Basic

Hardware Requirements: 24K Atari 800, disk drive,

Department: Entertainment

Sugg. Retail: \$24.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING	A	DOCUMENTATION	A	RELIABILITY	A -
USEFULNESS	A	VISUAL APPEAL	A	ERROR HANDLING	A -
VENDOR SUPPORT	C	EASE OF USE	A -		

Move over, Jack LaLanne! With your Atari computer and this program, you'll be whipped into shape in no time. (Well, actually, assume a couple of months, and then maintenance thereafter.)

Seriously, this package represents a pretty good, if lightweight fitness program, not to mention a healthier use of your Atari than spending all those indolent hours playing games. The program will first ask you for information concerning your age, sex, and heart rate in order to make a determination of your current fitness level. (You must take your own pulse relaxed and then after some warm-ups.) The program will then adjust its 8-exercise cycle to accommodate that level.

Exercise sessions are designed to last from 15 to 30 minutes, depending on your speed and the number of exercise repetitions. The eight basic exercises required are: (1) overhead stretch; (2) jumping jacks; (3) sit-ups; (4) hip lifts; (5) push-ups; (6) trunk twist; (7) running in place; and (8), toe touches. These routines are much in the order of "limber up" exercises. But if followed at least every other day they will greatly improve stamina and muscle tone.

You cannot input different exercises as you progress, only change the speed of the routines. You will be gradually required to perform more repetitions of these exercises and increase your pace. Graphics are very good with this package, providing a sort of mechanical exercise companion on screen, a tireless figure who shows you how to perform the required exercise. You may adjust the speed at which the figure does the exercises according to your level.

The program will also store and report to you on a daily and weekly basis (up to 30 weeks) the rate of your improvements, measured primarily through heart rate at rest and after exercise.

As with any exercise plan, you only benefit to the extent that you consistently invest the effort. But this program, which isn't too time-consuming or a terrible strain, makes it attractive to follow through with exercises and provides a regular measurement of your progress as an added incentive. All it seems to lack is music to exercise by.

TERRY

Company: Atari Program Exchange

Language: BASIC

Hardware Requirements: 32K

Department: Entertainment

Sugg. Retail: \$17.95

Availability: 5

Disk or Tape: Both

OVERALL RATING	D	CONTROLLABILITY	D -	ERROR HANDLING	C -
GAME CONCEPT	D +	SKILL INVOLVED	F	DOCUMENTATION	C
CREATIVITY	C -	CHALLENGE	D -	HOLDS INTEREST?	D -
GAME DEPTH	D -	GRAPHICS	N/A	VALUE FOR MONEY	D -

Terry is an Artificial Intelligence-oriented program designed with the idea of carrying on an intelligent conversation, in an "analyst" setting, via keyboard inputs and screen responses. It touches lightly on intelligence, and heavily on artificial.

The author's comments indicate that it is livelier than the well known program of the same type, *Eliza*. But neither program is very well done. The answers to keyboard input are clever the first time, if you don't get into more than four word sentences, but they rapidly become boring after a short time or inappropriate for complicated input. That it was created for ten year olds and up may give you some idea of its repartee.

It might be well received at a cocktail party after inputting a few libations. But I think the money would be better spent on other programs, such as Texas Instruments' *Speak-N-Spell*.

ASTROLOGY

Company: APX

Language: BASIC

Hardware Requirements: 40K; disk drive.

Department: Entertainment

Sugg. Retail: \$24.95

Availability: 3

Disk or Tape: Disk

OVERALL RATING **B**
USEFULNESS **B-**
VENDOR SUPPORT **C**

DOCUMENTATION **B**
VISUAL APPEAL **B-**
EASE OF USE **A**

RELIABILITY **B+**
ERROR HANDLING **A-**
VALUE FOR MONEY **C+**

Astrology programs define the mathematical relationships and patterns of planetary bodies in our solar system at the time of one's birth. Its premise is that there is a connection between planetary locations at birth and the way in which an individual's life unfolds. Why there should be such a connection is unknown. But several astrologers have proven statistically, through the charts of successful doctors, scientists, artists, sports figures, soldiers, business executives and politicians, that the location of Jupiter, Mars, Saturn and the moon were not randomly positioned at birth. While this does not prove astrology works, it is something more serious than the "stuff" you see in daily newspaper columns.

Being essentially mathematical in nature, astrology lends itself ideally to the computer. *Astrology* can calculate a natal chart at one's birth accurately to within one degree for any individual born since 1900. All that is required is the date and time of birth, plus the geographical coordinates of the place of birth. Since the latitude and longitude generally need to be looked up in an atlas, the authors have provided an alternative method. A map either of the United States or the world is displayed. The user can move a cursor around the map to locate his or her birthplace with the keyboard's arrow keys. When it is found, the return key is pressed and the computer automatically enters that position as the coordinates. Likewise, where the input of the correct time zone might be troublesome, this program simplifies input with a table of American and European time zones for both standard and daylight savings times.

The circular natal chart is plotted in Hi-Res detail using the standard astrological symbols and conventions. A redefined character set is implemented. This chart shows the sun, moon, and planets as they appear in the twelve astrological houses along the zodiac at the time of one's birth. The symbols of the zodiac appear on the lines (cusps) between each house. Each of the planets appear in the proper house, and the Ascendant (house that was rising at birth) is displayed at the upper left corner. The exact positions to the nearest degree for all solar system objects are tabulated at the upper left of the screen. The program also generates a chart of all strong planetary aspects. This takes into account whether two planetary objects are in conjunction or opposition to each other. This is quite important in astrological interpretation.

Astrology does very little to interpret one's chart. The documentation includes several lists of attributes associated with each planetary object as it appears in each house. But since proper interpretation requires you to consider both the good and bad aspects, it is best to consult one of the astrological reference books.

Astrology is a nicely implemented program. It is very easy to use, quite suitable for the amateur. Screens can be saved to disk and later printed out on a line printer (with graphics, if one owns a screen dump utility). Its accuracy, which is within one degree, is fine for amateur use, but probably not suitable for professional astrologers, who prefer to generate charts to the nearest minute.



ASTROLOGY

VIDEO EASEL

Company: Atari

Language: Machine

Hardware Requirements: 16K; joystick recommended.

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING

D

EASE OF USE

B

ERROR HANDLING

B+

GAME CONCEPT

N/A

SKILL INVOLVED

N/A

DOCUMENTATION

B

CREATIVITY

C-

CHALLENGE

N/A

HOLDS INTEREST?

D+

GAME DEPTH

N/A

GRAPHICS

C

VALUE FOR MONEY

D

Video Easel is an introduction to computer art. While its features are rather simplistic by today's standards, you have to remember that this cartridge was introduced three years ago, when nothing else was available. The program consists of two drawing modes, a preprogrammed painting mode that automatically operates six different kaleidoscope-type patterns, and Conway's game, "Life."

Both drawing modes can be accessed from the menu. Using the regular DRAW command you can guide a cursor about the Hi-Res screen. The cursor draws a colored line when it is depressed. There is no choice of colors, nor any features for filling color or automatically making geometric shapes. QUAD DRAWING is similar, except that four lines are drawn in a symmetric pattern.

Actually, the only interesting feature of this cartridge is Conway's game, "Life." "Life" is not a game in the usual sense, for in it there are no opponents or strategies. Rather, it is a simulation of cellular growth and evolution. You create a pattern (or colony), then observe the computer generate symbolic patterns representing the life and death patterns of the colony for each generation. Each successive generations of a colony are reproduced according to the following rules: any organism with 2 or 3 neighbors survives to the next generation; but an organism with 4 or more neighbors dies from overcrowding. Likewise, an organism with one or no neighbors dies from isolation. Each empty space (cell) with exactly 3 neighbors has a birth in the next generation. The "game" continues until either all cells have died or the colony reaches a stable configuration. The user can place many of the standard shapes (Big X, I Beam, Factory, Glider, Diagonal, Line) in positions on the screen, then watch them evolve in colorful stained-glass patterns.

While the cartridge is easy to use, it is certainly not a very comprehensive drawing program, even for beginners. If the cartridge didn't include "Life," it would hold little interest.

TRIVIA TREK

Company: Swifty Software

Language: Basic

Hardware Requirements: 32K, disk drive.

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 5

Disk or Tape: Disk

OVERALL RATING

C

CONTROLLABILITY

B

ERROR HANDLING

B

GAME CONCEPT

C-

SKILL INVOLVED

N/A

DOCUMENTATION

C

CREATIVITY

N/A

CHALLENGE

N/A

HOLDS INTEREST?

D+

GAME DEPTH

C-

GRAPHICS

N/A

VALUE FOR MONEY

C-

Trivia Trek is a multiple choice trivia test for one or, preferably, two players. Each test consists of 10 questions pertaining to a particular subject. Each question has four possible answers. If the player answers correctly, he scores 10 points; otherwise his opponent gets a chance to answer for five points. In the one player game, the second choice is worth five points if correct.

Trivia is defined as inconsequential facts about things. The program comes with a full disk of 50 different subjects, including: pop music, antiques, phobias, baseball, shopping, body language, dying, movie stars, and inventors. Can you name the person who invented condensed milk? Or do you know that 41% of shoppers carry a shopping list? Some of the questions, and their answers, are amusing. For example: What do most people do while sitting on the toilet? (1) smoke, (2) count tiles, (3) sing, (4) read.

Once you have tried all of the categories, it is time to create a trivia test. Each test consists of ten questions each with four answers. Each question can be 70 characters long, and the answers up to 20 characters apiece. Atari full screen editing is supported. The files are saved to a DOS compatible data disk.

The program is suitable for entertainment at small parties, or for a diversion on a rainy evening. The program is easy to use: input is entirely controlled by joystick. What is surprising about the program is the unnecessary amount of disk access required to load each question. Memory shouldn't be a problem, since each question only requires 150 characters or bytes. Ten questions need only 1,500 bytes. Finally, the buyer should be aware that programs of this type remain useful only if new questions are always added. Once you have seen the test questions, you don't try them again.

ABUSE

Company: Don't Ask Software

Language: Machine

Hardware Requirements: 40K, disk drive.

Department: Entertainment

Sugg. Retail: \$19.95

Availability: 2

Disk or Tape: Disk*

OVERALL RATING

C-

GAME CONCEPT

C

CREATIVITY

B

GAME DEPTH

N/A

CONTROLLABILITY

B

SKILL INVOLVED

N/A

CHALLENGE

N/A

GRAPHICS

N/A

ERROR HANDLING

B

DOCUMENTATION

C

VALUE FOR MONEY

C

HOLOS INTEREST?

C-

Abuse essentially offers a program that allows the user to trade insults with the computer. It has its roots in the program *Eliza*, where the computer responds to your input as if it were a psychiatrist. The computer acts on key words in any input sequence, and attempts to top your last insult. It even tends to be obnoxious, beeping at you if you ignore it. While most of its insults appear to be random, occasionally it produces a clever put down.

I'm not sure how to rate a program like *Abuse*. Certainly one man's pleasure is another man's poison. I've talked to some people who enjoy the program and others who hate it. Those who hate it become bored with it after five minutes, while those who like it will trade insults with the computer for hours. It certainly will relieve frustrations if you've had an altercation with your micro.

BISHOP'S SQUARE/MAXWELL'S DEMON

Company: Gentry Software

Language: Machine Language

Hardware Requirements: 48K, disk drive.

Department: Entertainment

Sugg. Retail: \$14.95

Availability: 3

Disk or Tape: Disk

OVERALL RATING

D

GAME CONCEPT

D+

CREATIVITY

D

GAME DEPTH

D

CONTROLLABILITY

C+

SKILL INVOLVED

D

CHALLENGE

C+

GRAPHICS

C

ERROR HANDLING

N/A

DOCUMENTATION

C-

HOLOS INTEREST?

D-

VALUE FOR MONEY

D

Bishop's Square consists of two programs. I hesitate to call them "games," since the second program, *Maxwell's Demon*, is a demonstration with which the user can interact, and the first is a puzzle.

The object of *Bishop's Square* is to allow the computer to take a Hi-Res picture, divide it into a number of smaller squares, scramble it, and have you rearrange it by shifting entire rows of columns until it is solved. The proper row or column to be moved is chosen by joystick, or keyboard control. The joystick button or Start key shifts the blocks with a wraparound feature. The Atari key will allow you to look at the original picture. Levels of difficulty range from dividing the picture into 4 squares up to 64 squares.

Maxwell's Demon illustrates the Second Law of Thermodynamics. It states that molecules of different mass, when mixed together, can not be separated without the help of a third party. Maxwell argued that these molecules could be separated if a demon sat at the gate of separation and allowed only molecules of a certain speed or density to pass. You play the demon, and try to separate the faster moving hydrogen molecules from the slower moving helium molecules by opening and closing a movable gate between the two chambers with a joystick. Both of these programs are fun to try once or twice, but neither has any lasting appeal.

BUSINESS

Introduction	210
Modeling	212
Accounting & Personal Finance	215
Word Processing And Accessories	226
Mail List Programs	242
Database Management Programs	246
Stock Market Programs	254
General Business	257

Business

As is readily apparent, Atari is primarily a games and graphics machine. The shortage of quality business software for the Atari computer is even more apparent when compared to the availability of business software for the Apple II and IIe computers, Atari's biggest competition in the home computer market.

Functionally, the two computers are quite similar. The real reason for this situation, therefore, is best attributed to Atari itself rather than to any inherent limitations of the machine. It seems obvious that somewhere along the line Atari decided to promote and merchandise their computers as "home" machines. There is no doubt that their marketing strategy has succeeded. Atari is indeed a dominant force in the home market, and the Atari VCS is presently *the* home entertainment machine. Unfortunately, this "game" mentality has carried over into the 400/800 and 5200 market. While these computers are excellent entertainment and educational machines, they can be as useful and perform as well as an Apple with business oriented software.

This software imbalance has made a very slow shift in the 1983 year. Already in the Atari market are serious business programs such as *VisiCalc* and *The Home Accountant*. Several excellent word processors are available to choose from such as *Atariwriter*, *Bank Street Writer*, and *Letter Perfect*. Indeed, the Atari has a great potential as a business tool, and we hope the 1984 year will help validate this assertion. Write to Atari requesting software in the area of business. Write to software publishers that have programs you like but at present will only run on other machines. Let them know of your interest in an Atari version of their product.

In terms of choosing business programs, you must determine which is the best product to meet your individual needs. Choosing the best product is not easy, and usually not something you can determine in a few minutes the way you might pick albums at a record store. If you are not in the position to write a custom program for your business, you've got to consider what you want carefully and study the market of available programs.

The first place to start is by examining how you presently perform your tasks and what you want your Atari to do for you. Gather together as much information as you can about how you currently produce reports, construct sales forecasts, monitor your budget, calculate your business profits, or whatever the jobs are. If possible, bring paper samples of what you are doing manually to your local computer store. Examples here might include contracts, form letters, invoices and other business forms, file cards, ledgers, and so on. This information will help you determine the kind of features you would like to see in a program and give you an idea of your present costs in getting this work done.

Another point to consider is how much information you want to handle. For instance, if you're looking at word processing, think about the average number of pages in your letters and documents, the detail of your contracts, the amount of letters you send out each week. Do you need a mail list program to go with it for the mass distribution of form letters, or a spelling checker to catch your errors? If you send out many form letters and/or contracts, how much do they differ from each other?

The same foreknowledge of tasks is needed for determining the usefulness to you of other types of programs. In selecting database programs, for example, you should be able to estimate how much information you will want to master and how that information needs to be organized. What kind of reports do you want? Do you want to include graphics, and if so, what type? Do you want to combine charts, graphs, and other kinds of illustrations in single reports, or be able to send them directly to typesetting equipment? Do you want to network your Atari with other computers and electronic workstations, and is telecommunications an important part of your business operation?

These are just a few of the kinds of questions you should be asking yourself in computerizing your business. Business software is more expensive than other types of programs. You'll want to get the most for your money, so take the time necessary to find out as much as you can about packages you are interested in, and whenever possible, try them out before purchasing them.

Modeling

So many spreadsheet and modeling-type programs are currently on the market that it presents a bewildering choice to the potential buyer. This introduction will attempt to describe what constitutes a modeling program and outline briefly the procedures for using such a program. However, it is first appropriate to discuss what a model is and what it is used for. A firm definition of terms is necessary.

Computer models are an electronic representation of reality. They exist in many forms. Recently, with the advent of high speed computers, a new form of model is appearing—the math model. For a considerable period of time, scientists have been attempting to describe reality using mathematical terms. The purpose of this description is to predict a future occurrence, given different sets of input assumptions. Such modeling attempts met with frustration until the invention of the high speed computer, because many of the modeling techniques require statistics and repetitive processing when the conditions of the model are changed, and the computations are run many times in order to obtain the optimal result. Because the computer excels in this type of analysis, the elements of a computer modeling system are the actual mathematical representations of the system to be modeled, and provisions for manipulation of that representation.

How can the home computer best be used in modeling? Let's look at the mathematical representation of reality. If we attempt to model a complex system in any detail, we find that the representation rapidly becomes quite difficult to build and interpret, developing into a mathematical construction that is beyond the capability of most home computers. That leaves the small computer to handle only the simplest of mathematical representations—those that require rather simple and straightforward computations. Fortunately, there is a class of models that fit this category and has a large market following: financial models. They are simple, straightforward, and the computations are generally within the capability of home computers. This judgment is reflected in the marketplace, since most of the modeling programs are directed toward financial modeling (either business or personal), and those programs that do allow a broader scope concentrate on financial situations.

Just how complicated can you expect a modeling program to be? Will it help, for example, in the generation of models? The simple answer is yes; however, it is also important to ask if it is economically feasible to produce complex programs. The answer to that is probably no. Remember the definition of a model: a representation of reality. Reality, as perceived by each person, is different, and each person must deal with many different applications. To develop a program that will model each of these different realities to suit all needs requires an insight by the programmer that defies imagination. The best we may expect for now is a modeling program that gives you, the user, tools to work with. The actual creation of models will be left to you, to make it as complex or as simple as needed. Perhaps in the future, processing techniques will be developed which will allow the computer to learn in Real-time, and turn general desires into specific model constructions.

What you should look for, then, are modeling programs that best assist you in developing specific types of models. For example, if the model is to be of an engineering system or other type of scientific application, then look for modeling programs that have trigonometric and/or other scientific functions. If a financial model is needed, then such things as depreciation schedules, net present value, and internal rate of return should be available for use. In short, those computational techniques that are generally difficult to program, but necessary to a great many models, should be in the modeling program you buy.

Now, how should the program manipulate the model once it is developed? In the "necessary" category falls the ability to accept the model and to be able to make rapid changes as required. The program should also be able to perform the model calculations in a timely manner and then report the results in a variety of ways. It would be advantageous if the program were able to create graphics, and assist in checking the model's internal logic for you. Other desirable features include the ability to edit data and/or model files, to use multiple data files with any given model, and to create data files from the model runs for later use in other models (or some other program). In short, the program should be as flexible as possible in its ability to handle data and model logic.

You should also give some thought to the form of your model. There are two basic types of modeling programs: spreadsheet and compiler. A spreadsheet is really an electronic worksheet where rows and columns intersect to form "cells." Each cell contains data, text, or a formula that relates that cell to any other single cell or group of cells on the worksheet. *VisiCalc* is one example of a spreadsheet program. The compiler program presents a model as a file of

equations and variables. The equations use the program's particular modeling "language," which generally parallels BASIC. At Run-time, the program will read the equation file and utilize them along with a file containing data to produce the results, which are then displayed or printed as a report. *TARGET Financial Modeling* is one example of a compiler type program. Either type of program—spreadsheet or compiler—will perform 90% of the modeling the home computer user would be expected to do. Spreadsheets are the most common. For the first-time user, they are probably the most straightforward to employ. On the negative side, however, the spreadsheet, once laid out, is not particularly flexible for reporting the results. Compilers are generally more flexible for reporting the output of a model and will handle more complex problems. But there is no "best" choice. You have to determine what will suit your own needs best.

Finally, consider a structured approach to developing a model and using modeling programs. The first thing you must do is make a very basic decision: what to model. This is more difficult to determine than it may seem. The assumptions that go into the model will have a profound effect on the outcome, and assumptions will be necessary for just about anything more difficult than the simple equation $2+2=?$ (even this equation demands the assumption of base 4 or higher arithmetic; if base 3 is used, the answer is 10). Keep the requirements simple to begin with and only model what is absolutely necessary.

When you determine the end product, sketch out the calculations that must go into that result. Find out what the last step is that gets you to the single number you want; then determine the step(s) to obtain the relevant variables. Next, back up from this intermediate calculation, and so forth, until you get to the variables that are to be entered. If you keep good notes, you should have (in reverse order) a summary of the model calculations. Given these results, go back to pencil and paper and sketch an outline of the type of report you would like to see produced that includes all of the variables to be entered, the intermediate calculations, and the final results. Generally, the variables will be at the top, intermediate calculations in the middle, and results at the bottom. This gives you the logic of the model and at least one report format.

Now, turn on the computer. That's right, up to this point you have not (or should not have) used the computer. Until you know what you want to do in outline form, the computer will only get in the way. There is no program yet on the market that will really act like a scratch pad—although some are coming close, and many advertise that they are. The way you now proceed is largely program-dependent. In general, you would enter the model logic in some form, either on a spreadsheet or in a logic file for a compiler program. Enter the data, the modeling program takes over, and you compute a result. Note that this is just a result, not necessarily the right result or the answer you want. Everything depends on the logic and assumptions that went into building the model.

The program should now give you options for output—either in report or graphics form (or both). Exercise whatever options you need to get the result you want.

Now comes the fun. Using the model and current data, you should be able to perform sensitivity analyses by changing one variable at a time in order to see how the answer changes in response ("what if" studies). In this way you can see which of the variables have the most control over the model. These variables will probably become the most important in your calculations.

That's the outline of model building and use in today's home computer environment. Who knows what the future will bring? Many programs are structured as described above—most of them oriented toward the financial model. The real differences lie in the versatility of handling the model and data, along with the ease of entry and manipulation of those items. Narrow down your choice and then ask to try out the software before making a purchase. You are the one who is going to have to be satisfied.

A final caution. Models are only a representation of reality, and only as good as *your* modeling data and parameters. If you are not familiar with the calculations that go into the type of model you want to create, have someone there who can do it for you. Unlike game programs, these system models demand that you know what you are doing from the outset. There are very few other types of programs where the maxim "garbage in, garbage out" applies more directly.

VISICALC

Company: Atari

Language: Assembly

Hardware Requirements: 40K, disk drive

Department: Business

Sugg. Retail: \$199.95

Availability: 9

Disk or Tape: Disk*

OVERALL RATING A +
EASE OF USE A +
VENDOR SUPPORT A

DOCUMENTATION A
VALUE FOR MONEY A
VISUAL APPEAL A

RELIABILITY A
ERROR HANDLING A

Let's assume you're in marketing and do financial modeling; or you're a businessman or accountant and need a quick accounting statement or cost analysis study considering the effects of variable interest rates; or you're an engineer who needs to do repetitive formula calculations. If so, then *VisiCalc* is not merely a useful program for you, it's indispensable. This program, which initially won an award as the single piece of software that most influenced the growth of the microcomputer industry, has been described as "The program worth buying a computer for."

Briefly, *VisiCalc* is an electronic worksheet. It employs up to 63 columns and 254 rows to work with. You may create any format you wish within these parameters, and perform whatever calculation or manipulation of figures you find desirable. Quite literally, any problem that can be solved by using a calculator or pen and paper can be done by *VisiCalc* better and much, much faster.

Any position on the *VisiCalc* worksheet can be defined as a label, value, or formula. More importantly, any formula can relate to any other positions or combination of positions on the sheet. Whenever any position's value changes, all other items that depend on that value change automatically, without further action on the user's part. For example, say you were doing business forecasting and wanted to increase sales 10% per month. By taking the sales value of the first month at, say, position B1, and simply defining the new month's sales at position C1 as "B1 * 1.1," the C1 value for the second month's sales would be instantly calculated. You may carry on projections through the rest of the year, using constant or variable values. Fortunately, *VisiCalc* has a series of commands, such as "Replicate," which enable the user easily to create rows or columns of repetitious values or formulas, even if each calculation is related to the previous formulas in preceding rows or columns.

VisiCalc features a complete set of arithmetic operations (+, -, ×, ÷) and exponentiation; financial functions, such as Net Present Value, Sum, Avg., Min., Max.; and trigonometry and logarithmic functions. In addition, the "Lookup" command allows the comparison of a value to the successive values in a given range, and returns the corresponding value from the column or row immediately to the right or below the entries in that range.

Other commands allow the user to fix titles while scrolling the locations in the table, or split the screen in sections so they can see only the portions of the table that they are currently using. Values can be formatted in dollars and cents, scientific or integer numbers, and flushed right or left. New editing features allow you to edit formulas without bothering to retype them from scratch. And one can easily move the cursor around the screen with the standard keyboard commands.

Files can be saved to a disk for later retrieval. Files can be stored as formulas for the calculations on the worksheet or in Data Interchange Format (DIF) for use with *VisiCalc*-compatible programs or other programs using the DIF format. The program also features full compatibility with all line printers. The system allows commands that will suppress or add line feeds and adjust the column width. One simply decides which section of the worksheet is to be printed, places the cursor at the top left, indicates the bottom right of the appropriate block, then prints. Large worksheets, of course, have to be printed in sections. Either the calculations or the formulas can be sent to the line printer.

The documentation is excellent. Its manual contains a good tutorial for users who have absolutely no experience in programming. It takes between one and two hours to master. A 4 lesson tutorial offers many practical examples and illustrations. The 144-page command reference section offers very good explanations, and some examples of each command using screen illustrations. Best of all, *VisiCorp* includes a superbly organized chart of all the commands, and a handy foldout reference chart.

To sum up, *VisiCalc* is a uniquely versatile product applicable to a wide variety of uses and users. *VisiCorp* has provided retail stores with an excellent demo of *VisiCalc*'s capabilities. Check it out. This is a straight "A" classic, and well worth investigating.

Accounting & Personal Finance

ACCOUNTS RECEIVABLE

Company: The Computer Seen

Language: BASIC

Hardware Requirements: 48K, 810 disk drive or 410 program recorder, BASIC cartridge, optional line printer.

Department: Business

Sugg. Retail: \$24.95 cassette/\$39.95 disk

Availability: 5

Disk or Tape: Both

OVERALL RATING
EASE OF USE
VENDOR SUPPORT

C
C
B

DOCUMENTATION
VALUE FOR MONEY
VISUAL APPEAL

B
B
C

RELIABILITY
ERROR HANDLING

C
C

This program does what its title implies — it keeps track of the accounts receivable of a small business. The program is simple and straightforward to use, and can be customized to suit a variety of individual needs.

One of the program's advantages is that it can be either cassette or disk based, making it one of the very few accounting programs available for the program recorder. The documentation is relatively clear, although a couple of spots could stand improvement.

Now to the disadvantages. First, the capacity of the program (30 customers maximum per disk, at 15 transactions each, and \$9999.99 maximum dollars on totals) makes it unsuitable for anything but a very small business. Secondly, to customize the program requires re-programming in BASIC, making it inconvenient for the less experienced user. The program can be inadvertently abandoned by accidentally pressing the Break key. Recovery is possible through a BASIC command, but information prior to the break is terminated, or lost. Also, once customer information is input (name, address, phone number), the only way I found to change it was to delete the entire record and start from scratch. Lastly, although menu driven, the program is a bit user unfriendly; and unless one remembers the precise sequence of events to perform a particular function, it might be necessary to return to the menu and start again.

All in all, the program seems a good value for the money, costing a fraction of the price of other programs which accomplish similar duties. For a small concern, this program could be a valid consideration.

THE BOOKKEEPER

Company: Atari, Inc.

Language: BASIC

Hardware Requirements: 32K, disk drive.

Department: Business

Sugg. Retail: \$149.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING
EASE OF USE
VENDOR SUPPORT

A
B+
B+

DOCUMENTATION
VALUE FOR MONEY
VISUAL APPEAL

A
A
A

RELIABILITY
ERROR HANDLING

A
A

When a discussion centers on accounting or bookkeeping, the four major areas of discussion most often are: general ledger, accounts receivable, accounts payable, and payroll.

A general ledger may be briefly defined as a series of reports or records that shows the current overall financial picture of a business. Information relating to sales, monies spent, and monies received are entered into a general ledger journal. At the end of a set period, usually a month, this information is used to produce a number of reports. The two most important of these reports are a profit and loss statement, and a balance sheet. The profit and loss statement shows, for the period covered, the total sales or revenues, and the costs associated with production which, when subtracted, yields the gross profit. After gross profit, a list of expenses, such as salaries and advertising, is then subtracted leaving the net profit or loss for that period. The balance sheet then shows the sum total of the current and long term assets and liabilities of the business. Accounts receivable records who owes you money. A full (A/R) program tells you the duration of the loan. Accounts payable presents the situation in reverse. That is, who do you owe money to and when is it due? Payroll of course, is self-explanatory.

Some controversy arises as to the degree of importance of these four major bookkeeping areas. Customers often ask computer store employees which bookkeeping function should be computerized first. The answer settles on either the general ledger, or the accounts receivable. If sales of bookkeeping modules are any indication, most people seem to prefer starting with the general ledger by a ratio of 2 to 1 over accounts receivable.

As to, *The Bookkeeper*, you can, to an extent, "have your cake and eat it too." Although *The Bookkeeper* is primarily a general ledger system and not a full bookkeeping package, it will allow you to record and produce accounts receivable and accounts payable information.

In general the program is sufficiently well designed and documented to allow for efficient, accurate usage.

The Bookkeeper will do the following:

- 1) Allow up to 350 total accounts which include any customers and/or vendors you wish the system to record.
- 2) Account names may be up to 30 characters in length, although only 20 will appear on a printed report.
- 3) Up to 1,000 distributions are permitted in any month. However, be aware that every entry in the journal requires at least two distributions, a debit and a credit.
- 4) Account numbers that you assign in your chart of accounts if limited to four digits.
- 5) The system will accommodate up to 10 departments, or profit centers, with the ability to produce a (P&L) statement for each, as well as a consolidated (P&L).
- 6) The maximum dollar figure that can be input is 999,999.99, although two more digits can appear as a total on a report.

In addition to the normal reports produced by a general ledger system, this program will also record and produce the following:

- 1) Checks written — records all checks written during the period.
- 2) Cash received — records all checks, and/or cash received during the period with totals.
- 3) Invoices written — records all cash sales and bills sent to customers with totals, although it does not "age" these receivables by the length of time that the monies are due.

If after careful examination of your requirements you determine that this program's features can handle your job, then *The Bookkeeper* is highly recommended as an excellent investment for your business.

MILES PAYROLL SYSTEM

Company: Miles Computing

Language: BASIC

Hardware Requirements: Atari 800, 10K ROM, 32K RAM,
2 Atari drives, 850 module, printer.

Department: Business

Sugg. Retail: \$179.95

Availability: 2

Disk or Tape: Disk

OVERALL RATING **B +**
EASE OF USE **B**
VENDOR SUPPORT **C**

DOCUMENTATION **B**
VALUE FOR MONEY **B +**
VISUAL APPEAL **B +**

RELIABILITY **B +**
ERROR HANDLING **B +**

One of the most infrequent business programs to be seen on microcomputers is Payroll. The reasons for this are apparent. First, the tax laws in this country appear to have been deliberately written to be as complex, illogical, and incomprehensible as possible. They are obviously designed for the sole benefit of accountants, lawyers, and tax preparers. To add confusion to an already confusing situation, the government changes the rules and forms and changes them often. This is particularly true on the state and local levels. Secondly, any computer payroll program must contend with the fact that the tax laws are different in every state. In view of this, it is little wonder that so few programmers or software publishers attempt to market a payroll program for microcomputers.

There is another aspect that you, as a potential purchaser of a payroll program for your microcomputer, should consider. Over the past several years outside payroll services designed for the small business have become very popular. I'll use the company for which I work as an example. Our company, a relatively small one, has about 50 employees. Some of our employees are paid on a weekly basis, some monthly, some on a flat weekly or monthly rate, and still others are paid by the hour. At one point we did our payroll on a small microcomputer (not on an Atari and not using the payroll program being reviewed here). It took one person approximately 25 hours a month to tend to our payroll needs. A few months ago we switched to an outside service, and it now takes one employee approximately one hour a week to call in the necessary information. The checks are then delivered the next day. Also, the service provides us with all of the necessary forms that have to be filed with the federal and state authorities. The cost to us is approximately eighty dollars a month. Is an outside payroll service for everyone? Perhaps not, but it should be considered before you make your decision on how to best fulfill your payroll needs.

On the other hand, if you, as an Atari 800 owner would like to use your computer to help prepare your payroll, my opinion is that the *Miles Payroll System* is worth your consideration.

The general features and specifications of the program are as follows:

- (1) maintains up to 50 employees
- (2) allows weekly, biweekly, semimonthly, or monthly pay periods
- (3) accommodates regular, overtime, doubletime, sick, holiday, vacation, bonus, and commission earning categories
- (4) deducts federal withholding tax, state withholding tax, city withholding tax, FICA, SDI, group insurance, and three user defined deductions.

- (5) offers a tax sheltered annuity deduction capability
- (6) maintains state and federal unemployment insurance
- (7) prints payroll checks
- (8) maintains pay period, monthly, quarterly and yearly cumulative totals for each employee
- (9) allows for manual payroll check writing

In order to get around the problem of having to change federal and state tax rates, the program allows the user to set up a "table" of rates which he can then modify as circumstances dictate. Of course, it is the user's responsibility to be aware of new changes in the tax laws, and to make the necessary modifications to the program.

Reports generated by the program include:

- (1) period-to-date standard deductions
- (2) month-to-date standard deductions
- (3) year-to-date standard deductions
- (4) period, month, and year-to-date group insurance
- (5) month-to-date worker's compensation
- (6) quarterly report
- (7) tax sheltered annuity deduction
- (8) yearly report
- (9) yearly earnings
- (10) employee pay history
- (11) time card entries
- (12) mail and time card labels printed
- (13) W2 forms report, but no provision is made for form 941

THE COLOR ACCOUNTANT

Company: Programmer's Institute

Language: BASIC

Hardware Requirements: 48K

Department: Business

Sugg. Retail: \$79.95

Availability: 3

Disk or Tape: Disk

OVERALL RATING
EASE OF USE
VENDOR SUPPORT

C-
C
D

DOCUMENTATION
VALUE FOR MONEY
VISUAL APPEAL

C-
C
C

RELIABILITY
ERROR HANDLING

C-
B-

The Color Accountant, a financial management program, records checks and deposits; balances your checkbook; records savings, loans, and investments; prints checks, budget spending, and savings; graphs financial data; keeps track of bills to pay and appointments to keep; and records and prints mailing lists. It also provides a checkbook search that lets you find a check by number, name, category, subcategory, or date. You can also compute and print out your net worth and income expense (balance sheet) statements.

The program comes on three disks. Ten menu options help you access the necessary information, but in order to get started you must use either the standard chart of accounts supplied with the disk or create your own. The account numbers have areas reserved for assets, liabilities, equity, income, and expenses. You can enter ninety-nine major categories and ten subcategories. Loading the chart proves of importance because many of the programs require this file in order to process your records. When I used the program, the chart did not save to disk properly on four out of six attempts, preventing the use of the interrelated programs. I also had problems determining which of the three disks plus my data file disk to insert, and the manual offered little help.

The appointments calendar runs slowly, but feeds data either to the screen or the printer. In general, I noticed slow key response on many inputs, and it took some time to load the programs. I found the color graphics less than exciting, on top of which the manual did not explain what the numbers with the graphs meant. The account names for the bar graphs often got cut off at the end. Worst, the documentation, although lengthy, proved totally inadequate. I see no reason why the company could not write clearer and simpler explanations so that an average user, like myself, could understand the program after several hours of study. I called the company four times for help when the programs failed to run properly, but no help was available. (I suspect a flaw in saving the standard chart of accounts.)

The program has merit, of course, since it does access a large number of categories for information storage and retrieval, but overall I found it unreliable and cumbersome to use.

THE HOME ACCOUNTANT

Company: Continental Software

Language: BASIC

Hardware Requirements: 48K, Disk Drive [Printer optional but recommended]

Department: Business

Sugg. Retail: \$74.95

Availability: 7

Disk: Disk

If you have ever had occasion to read articles or books pertaining to personal financial planning, I'm sure that you have noticed that there is a common theme that always appears: you cannot plan on where you are going (financially speaking) unless you know where you are now. So, if you are concerned about planning for your financial future, this program is a *must* first step.

The Home Accountant will handle your checkbook and budget, and is capable of processing up to five checkbooks and 60 budget categories. Checks may be printed if desired. *The Home Accountant* will assimilate and print a personal balance sheet showing your current net worth, as well as a monthly income statement. The Balance Sheet can be compared to a current or previous month's budget. The income statement shows the current month's financial resources; additionally, it can be used for comparison of the previous month's income.

A very powerful feature included in the system allows a complete listing of every transaction for any budget category. For example, you can obtain information on all checks written to the same person in any budget category or all checks that may be tax deductible in any category.

The program allows for approximately 500 transactions per disk. It also allows for the use of multiple diskettes. You may set up your program for either a calendar or fiscal year.

To borrow from the old Chinese proverb, "One picture is worth a thousand words." *The Home Accountant* allows not just one, but three ways of charting any account in Hi-Res graphics. Bar graphs may be used, for example, to show relationships between actual expenditures and budgeted amounts. Trendline graphs can be used to dramatically show current trends for your assets. Lastly, any three categories can be plotted at the same time.

In short, if you wish to keep tabs on your current financial position in order to effectively plan your financial future, get this program. It is the most flexible and versatile personal financial budgeting and planning package on the market today for the Atari computer.

FAMILY FINANCES

Company: Atari

Language: BASIC

Hardware Requirements: 32K

Department: Business

Sugg. Retail: \$49.95

Availability: 9

Disk or Tape: Disk

OVERALL RATING

B+

DOCUMENTATION

A

RELIABILITY

A

EASE OF USE

A-

VALUE FOR MONEY

B+

ERROR HANDLING

A

VENDOR SUPPORT

A-

VISUAL APPEAL

B-

Family Finances analyzes home budgets in more ways than most families are ever likely to use, but it will not create a budget. That is an important distinction; the program promises to "organize and analyze personal finances," but that is useless unless a budget exists. You should get professional help—from an accountant or banker, for instance—before expecting *Family Finances* to work miracles.

The package is further limited by its ability to track only one year's worth of data. Homeowners concerned about a rising utility bill, for instance, could not compare March 1983 with March 1984 to decide whether the new solar panels were cost-effective.

Family Cash Flow, the first of the program's two disks, records income/expense information in up to thirteen categories for each of twelve consecutive months. Once the information is entered, it may be recalled by category or month. The disk comes with information in the form of a sample session which, combined with step-by-step instructions, makes all the options understandable.

The second program, Family Budget, is excellent for identifying trouble spots. It blends proposed and actual income/expense in every possible combination to illustrate errors in judgement: budget expense (or income) vs. expense (budget or actual), and single category income/expense. All this can be presented for a particular month or the entire year. The first half of the package, in other words, is a ledger; the second half analyzes and averages the data.

Suppose, six months into the year, you notice that expenses have exceeded the proposed budget by several hundred dollars. (That empty spot in the bank account might be a slight hint.) A quick look at Yearly Budget vs. Actual Expense reveals the deficit to have occurred in January. Closer examination of that month shows an unexpected "automotive" expense which covered that sudden transmission trouble. Subsequent months will

illustrate whether the problem was one-time (and therefore inconsequential in terms of the overall budget) or chronic (which means your 1965 Chevy finally needs to be junked).

All prompts in *Family Finances* work cleanly and quickly, and the required information always appears within half a minute. While two disk drives will decrease work time, the package performs reasonably well with one. Messages such as "I'm doing it now!" inform you of progress. Those owning a printer can obtain hard copies of their financial reports. *Family Finances* performs its functions admirably, but it will only be helpful to those who already know something about home budgeting.

FINANCIAL WIZARD

Company: Computari

Language: Atari BASIC

Hardware Requirements: 24K, disk drive, printer optional.

Department: Business

Sugg. Retail: \$59.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING **B**
USEFULNESS **B**
VENDOR SUPPORT **B**

DOCUMENTATION **B**
VISUAL APPEAL **A**
EASE OF USE **A-**

RELIABILITY **A**
ERROR HANDLING **A**
VALUE FOR MONEY **B+**

Financial Wizard is in many respects a well-conceived and useful program. It is both a checkbook program and home budget program. For budgeting, the program will accommodate 21 major expense categories, 1 income category, and 4 record-keeping categories. For your checkbook — and you are limited to one — the program can handle up to 100 transactions per month with a one disk drive system, and up to 220 transactions with two drives. Information pertaining to your checkbook may be "filed" and subsequently searched for using as many as 7 search parameters. Additional features include printing personalized checks and bar graphs.

In general, my recommendation is a favorable one, with some reservations. My primary dissatisfaction is simply that, for my purposes, the program isn't powerful enough. For instance, in my family, and I'm sure this is by no means uncommon, we have more than one checkbook. We also have more than one source of income: both my wife and I work. And what about income from non-salary sources, such as savings account interest, stock gains, and so on? In this program, I'd have to lump everything together. I also found that I would run out of categories in *Financial Wizard* if I really wanted a detailed expense record.

What the program does, it does well. It is easy to use, and, within its distinct limitations, well designed. Unfortunately, for my family it just doesn't go far enough.

THE MONEY PROCESSOR

Company: Luck Software

Language: Assembly

Hardware Requirements: 48K

Department: Business

Sugg. Retail: \$80.00

Availability: 3

Disk or Tape: Disk*

OVERALL RATING **B+**
EASE OF USE **B+**
VENDOR SUPPORT **A**

DOCUMENTATION **B+**
VALUE FOR MONEY **A-**
VISUAL APPEAL **A**

RELIABILITY **A**
ERROR HANDLING **B**

The Money Processor, a spreadsheet program, comes with two copy-protected program disks and a specially formatted Master data disk. You can use up to 255 data disks, which you can back up if you wish. A printer lets you obtain a hard copy record. You can specify disk drives from one to four. Although designed for the Atari 800, the program works with the 1200XL nicely. It best suits a home computer user, not businesses. The accounts menu includes seven categories: Credit Cards, Checking Accounts, Savings Accounts, Cash, Employee Expense, Tax Return Items, and Budget Items. Totals in brackets represent money you owe, and totals without brackets represent money that you already possess or that someone owes you. You can define subcategories to fit your own finances. For example, if you have three checking accounts, you can list them separately because *The Money Processor* keeps track of debits and credits for each account.

You enter all expenses as they occur, and enter and verify statements when they arrive from the bank or a creditor. The Search feature tracks down a word or phrase, helpful in case you've forgotten the date or amount of a check.

There is a free-space window which keeps you informed of data storage and tells you when to add another data disk. Also, a scrolling "moving window" permits entry of up to forty characters to describe a particular transaction on the same line as the date and dollar entries. Unfortunately, the program does not support the Atari CX85 keypad.

The well-organized and well-illustrated documentation consists of an Operation Guide and an Owner's Manual. Although rather wordy, they enable even the computer novice to run the program. Error handling seems adequate, although you should watch out for unwanted duplication while verifying statements. At any rate, the author does invite written inquiries about problems that arise. I consider *The Money Processor* a worthwhile investment for people who have trouble keeping track of their money—the program helps you monitor your financial position on a day-to-day basis.

MONEY MANAGER

Company: The Programmer's Workshop

Language: BASIC

Hardware Requirements: 32K

Department: Business

Sugg. Retail: \$19.95 disk/\$14.95 cassette

Availability: 3

Disk or Tape: Both

OVERALL RATING **C+**
EASE OF USE **B**
VENDOR SUPPORT **C**

DOCUMENTATION **B**
VALUE FOR MONEY **C**
VISUAL APPEAL **C**

RELIABILITY **B**
ERROR HANDLING **C**

Money Manager by the Programmer's Workshop is a useful program which helps you understand the old adage, "nothing's free." It answers questions concerning the cost of money, loans, and interest earned on savings, loans, and investments.

After booting the disk you are greeted by the three options of the Main Menu. Option A, "On Investments," includes eight modules:

- 1) Interest rate, nominal and effective.
- 2) Minimum investment to achieve a goal.
- 3) Initial investment to achieve a goal.
- 4) Regular deposits to achieve a goal.
- 5) Future value of investments.
- 6) Future value of investments using regular deposits.
- 7) Withdrawals from investment.
- 8) Earned interest table.

All eight modules for the most part offer a variation of the same equation. The terms of principal, interest, and length of loan vary depending on what information you are seeking.

Option B, "On Loans," is the flip side of "On Investments." Again, there are eight modules:

- 1) Annual interest rate, total cost, and interest on a loan.
- 2) Principal on a loan.
- 3) Regular payment on a loan.
- 4) Remaining balance on a loan.
- 5) Term of a loan.
- 6) Final payments.
- 7) Loan payment.
- 8) Mortgage amortization table.

Module 8 will give you a complete history of your mortgage; however, be forewarned that this program is written in BASIC. If you want to see all 30 years, which can be output to the screen or a printer, take your lunch break and the finished printout will hopefully be waiting for you.

The last option, "Depreciation," calculates the percentage of depreciation of an item's original selling price to its resale price. This is not the same as the ACRS used in your Federal Income Tax, so you can't apply it there. Some states allow a declining balance method of depreciation where this option might be useful.

The program, although slow to perform some of the lengthy calculations, does what it sets out to do, which is to show you the cost (and/or gains) in using your money. Whether or not the program justifies its cost will be contingent upon your own income. If you borrow or invest lightly, say a couple of times a year, then *Money Manager* may be a needless luxury. But if you have many financial questions or want to charge interest to your business associates on a two year loan, then *Manager* is just the right program. The disk can be backed up by using the COPY option in DOS

(though no mention is made of this in the manual), and the documentation offers a good tutorial, and is both complete and easy to understand. The program itself is user friendly, prompting you for all needed information.

I found *Money Manager* a useful program. Now all I have to do is get Mungo out there to collect my loans.

PERSONAL FINANCE SYSTEM

Company: Dynacomp

Language: BASIC

Hardware Requirements: 24K

Department: Business

Sugg. Retail: \$34.95 disk/\$29.95 cassette

Availability: 4

Disk or Tape: Both

OVERALL RATING **B**
EASE OF USE **B+**
VENDOR SUPPORT **B+**

DOCUMENTATION **C**
VALUE FOR MONEY **B**
VISUAL APPEAL **C**

RELIABILITY **B**
ERROR HANDLING **N/A**

A user-friendly program, *Personal Finance System* maintains, corrects, sorts, and displays your personal financial records. Dynacomp suggests that you first make a back-up copy of your program disk for everyday use. Once you have done that, you are ready to start your data file. This menu-driven program offers a number of choices, then guides you through the process of entering data. One file holds a minimum of 300 transactions (with a single drive) to a maximum of more than 800 (with two drives). Depending on your financial activity, one file can hold data from a month's transactions up to a year's.

Personal Finance System contains nine important functions. "Create" helps you start a new data file, to which you make additions using "Addata." The program prompts you for input on each record and numbers each transaction. I would have preferred an option to number the records myself, but this is a minor point. You next enter the date, the amount of the transaction, the entry's tax status (for later retrieval if deductible), and the transaction code (for cash, deposit, monthly bank charges, or deletion). Hitting the Return without a code means the transaction was a check. The next prompt asks you for a user code. These you choose yourself from the letters of the alphabet, such as "L" for all loan payments. The final entry, payee, must not exceed seventeen characters. At this point you verify that the record is correct and change any errors. I would have liked to have one more field for comments, but that would take space in the memory from records.

To go back and correct files or change fields, you can use the Fixit option. When you back up a file using the Utility option, you can delete records by placing "X" as the transaction code. When using the Utility function, you back up and then restore the original file to create more space for new entries. The checkbook balancing function (Balance) works the same as most bank statements. You enter a starting balance, standard credits, and debits. You can add check fees as a lump sum or alter the program code to deduct a set amount for each check. The Select option lets you see or print records, but only expenses—it will not list deposits, monthly charges, or cash payments. You can call up all tax deductible expenses or payments under a specific user code, or payments to one payee. Asking for a monthly summary of expenses creates a separate data file called Barmon.dat, which plays a role in the Mongraph option. This function displays a Monthly Expenses bar graph based on an entire year's data.

The final options let you evaluate expenses by payee. The Sortpayee option creates a data file sorted alphabetically by payee. The Sumpayee option reads this file and summarizes expenses for each payee. All of the options allow output to either the screen or a printer.

Personal Finance System helps you through each step. As its name implies, it best suits personal bookkeeping. The manual, much neglected by software companies in general including this one, consists of small type on cheap paper. I liked the appendix, which lists changes you can make to the program code to automatically add check fees, or expand the program to a two-drive system. I found this program valuable and moderately priced, particularly when considering Dynacomp's excellent customer support.

HOUSEHOLD FINANCE

Company: Creative Software

Language: BASIC

Hardware Requirements: 32K; disk drive or cassette player.
Printer optional.

Department: Business
Sugg. Retail: \$39.95 disk / 24.95 cassette
Availability: 3
Disk or Tape: Both

OVERALL RATING	D	DOCUMENTATION	C	RELIABILITY	B
USEFULNESS	C+	VISUAL APPEAL	B	ERROR HANDLING	B
VENDOR SUPPORT	C	EASE OF USE	B	VALUE FOR MONEY	C

Household Finance is a title that implies much broader capabilities than the program actually delivers. Specifically, this program only tracks, records, and reports on your personal household budget. Anything that will assist you to manage personal finances more effectively will normally get a positive vote from us. But, in this case, the program does not have enough capability to really handle well even its single function, household budgeting.

General categories and expense categories are limited to 15 each, far too few in my opinion. Another drawback is that the categories are fixed, and can not be changed or created according to your desires. The graphic representations of the information are nice, though not extraordinary. All in all, though a good concept for a computer program, *Household Finance* just does not take the idea far enough to offer the average householder much assistance.

HOME INVENTORY

Company: Creative Software

Language: Atari BASIC

Hardware Requirements: 32K; disk drive or cassette player,
Printer optional.

Department: Personal/Home
Sugg. Retail: \$24.95 disk / \$19.95 cassette
Availability: 3
Disk or Tape: Both

OVERALL RATING	B	DOCUMENTATION	C	RELIABILITY	B
USEFULNESS	B	VISUAL APPEAL	B	ERROR HANDLING	B
VENDOR SUPPORT	C	EASE OF USE	B	VALUE FOR MONEY	B

As the title of the indicates, *Home Inventory* is designed to help you in the rather tedious job of keeping track of your household possessions. As a concept, it addresses a worthy goal. I'm sure that the majority of us do not take the trouble to perform this dreary and time consuming function, however valuable it might be for insurance or estate reasons. This is something that should be done. If having this program prompts you to perform this task, then it's worth having.

The first small (but annoying) point is that you have to load the program yourself, rather than having the main menu automatically appear on the screen when you boot up. The program will allow the retention of all necessary inventory data, such as serial numbers, name, description of the item, purchase date, and current value. You are also able to search for specific information using these categories. This is helpful for retrieving information, and altering data where appropriate (e.g. listing new replacement costs). If you have a printer available, you may print out lists of your inventory to store in a safety deposit box or for insurance purposes.

Any good stationary store can supply you with a home Inventory Book that would perform this task adequately. But the convenience, and more importantly, the flexibility, of having your computer keep track of it makes the program a rather attractive one.

HOME INVENTORY

Company: APX

Language: Atari BASIC and Machine

Hardware Requirements: 32K

Department: Business
Sugg. Retail: \$24.95
Availability: 7
Disk or Tape: Disk

OVERALL RATING	B	DOCUMENTATION	A-	RELIABILITY	B
EASE OF USE	B	VALUE FOR MONEY	B+	ERROR HANDLING	B+
VENDOR SUPPORT	B	VISUAL APPEAL	B		

Home Inventory by RLM Micro Systems is distributed and marketed by the Atari Program Exchange. The program provides an organized way of recording personal property to aid in protection against loss by theft or

disaster. It could also aid in determining insurance needs or be used to judge the value of an estate. The straightforward documentation provides numerous illustrations on program use, and little or no computer literacy is required to run the program. You may enter an item by name, description, three letter category (e.g., COM for computer equipment), serial number, date of purchase, and value. A permanent record can be made of up to 1,200 items per data disk, with no limit on the number of data disks. Complete or partial lists may be printed on a printer.

Adding to or deleting items is simple. Just select whether you want to add data or retrieve data (for updating). The inventory list may also be printed to the screen, and there is a search and sort routine (in Machine language) for finding selected items. At the end of the printed report, a total for the number of records and dollar amount is printed.

The program is simple to use, though there are three things which could have made this program better. First, the program is non-DOS compatible and copy protected, so there is no way to back it up. If your house and computer go up in smoke, you will need to obtain another computer and program disk just to retrieve data from the data disk you sequestered in a safe storage spot. Second, it would have been helpful to have the program calculate a depreciation schedule and/or replacement cost schedule for each item. Third, the Atari numerical keypad is not enabled by the program, making it tedious to enter all those dates, values, and serial numbers with the computer keyboard.

On the whole, however, *Home Inventory* is a good program at a reasonable price. Just be sure to keep your program and data in a safe place (bank safe deposit box or with a friend), and back up your data regularly.

THE TAX ADVANTAGE

Company: Continental Software

Language: BASIC

Hardware Requirements: 24K

Department: Business

Sugg. Retail: \$59.95

Availability: 8

Disk or Tape: Disk

This program will help you through the maze of tax forms and schedules while saving wear and tear on your calculator, your eraser, and your patience. *The Tax Advantage* prepares Form 1040, schedules A, B, C, D, E, G, SE, and Form 4562 (the depreciation schedule). Form 1040 is divided into 10 screens with line numbers matching those on the form. The screens are clear and easy to read. They contain a maximum of 9 double-spaced lines with a function menu underneath noting the commands available for that screen. Long descriptions for most lines may be displayed in the function window. This is a nice feature which avoids cluttering up the form. Paging through the screens and lines is a breeze, and all entries are easy to add to, change, or delete. If you make an invalid entry or command, no warning message is displayed, and this could cause some confusion. However, the documentation is very clear and should ease you over any difficulties.

The real power of the program is in its handling of itemizations and calculations. Itemizing certain lines takes you to the appropriate tax schedule. When you are finished with your entries, the total from the itemization is then placed on the correct 1040 line along with an "I." The linking of schedules with form 1040 eliminates much of the confusion about when to use each schedule. All calculations are made after each line entry, so you can see the effect of each entry on your tax at any point. The tax, the amount you owe, and your tax bracket appear at the bottom of any 1040 screen at the touch of a key. You can even vary your entries or override them momentarily in order to see the effect on your tax, or to estimate next year's tax liability.

In spite of all of its excellent features and ease of use, *The Tax Advantage* does not complete your taxes for you. The program will print out the forms and itemizations, but it does not print on the IRS forms, so you will have to copy each line onto the correct form. (Atari, Epson, NEC, and Centronics printers are supported, or you may specify your own printer's control codes.) You will still need to have your tax instructions at hand for reference.

The program resides on two sides of a disk, and each return is written to a separate data disk. This means a lot of disk swapping if you only have one drive, which can become tiresome and slow you down. Even with two drives you will still have to flip the program disk over every time you change forms.

A \$10.00 warranty registration fee is required which entitles the purchaser to one year of software support and program updates as well as half off the purchase price of next year's program revision. The cost of the program is tax deductible if you file schedule A.

Apart from the frequent disk swapping, *The Tax Advantage* is a joy to use. It takes away some of the drudgery of preparing taxes while adding a good measure of control over the results.

CAR COSTS

Company: Creative Software

Language: BASIC

Hardware Requirements: 32K; disk drive or cassette player.
Printer optional.

Department: Business
Sugg. Retail: \$19.95 disk/\$14.95 cassette
Availability: 3
Disk or Tape: Both

OVERALL RATING	D -	DOCUMENTATION	D	RELIABILITY	B
USEFULNESS	D	VISUAL APPEAL	C +	ERROR HANDLING	B
VENDOR SUPPORT	C	EASE OF USE	C	VALUE FOR MONEY	D

The purported objective of this program is to allow you to conveniently keep track of the cost of operating your family car. The key word here is convenient. With this program, unfortunately, it's not. The program allows up to five expense categories (which are not enough to meet most needs); and it will also give you fuel consumption data, trip costs, and a history of expenses.

The problem arises from the fact that you have to keep a note book in your car and write all this information down anyway. Thus, the only thing the computer does for you is to add up the figures. It would be faster and more flexible with a calculator.

The program itself is confining in the way it's set up. It does not allow you to record enough information, and its overall structure is too inflexible. Documentation may at best be described as "mediocre."

FAMILY VEHICLE EXPENSE

Company: APX/Atari Program Exchange

Language: Atari Basic

Hardware Requirements: 48K Atari 800, disk drive

Department: Business
Sugg. Retail: \$22.95
Availability: 3
Disk or Tape: Disk

OVERALL RATING	A -	DOCUMENTATION	B	RELIABILITY	A -
EASE OF USE	B +	VALUE FOR MONEY	A -	ERROR HANDLING	A -
VENDOR SUPPORT	C	VISUAL APPEAL	B +		

Although titled *Family Vehicle Expense*, this program could be of use to either a small business or a large family. The program is designed for, and does a credible job in, keeping track of vehicle expense. It accommodates up to six vehicles, and allows for up to nine associated expense categories. Information is given on a monthly basis for up to a full year. You may keep track of up to ten credit cards. The program will also convert liters to gallons automatically, and allows twelve fuel entries per vehicle per month.

I found this program relatively easy to operate, and it produced informative and nicely designed reports. It can be a very worthwhile budget tool for either the moderate income family with several cars, or the small business that must keep track of car rental expenses, gas cost, and related items.

MORTGAGE AND LOAN ANALYSIS

Company: Atari

Language: Atari Basic

Hardware Requirements: 16K Atari 400/800, cassette, printer helpful

Department: Business
Sugg. Retail: \$19.95
Availability: 9
Disk or Tape: Tape

OVERALL RATING	B +	DOCUMENTATION	C +	RELIABILITY	A -
EASE OF USE	B +	VALUE FOR MONEY	B	ERROR HANDLING	A
VENDOR SUPPORT	B +	VISUAL APPEAL	B -		

Atari's *Mortgage and Loan Analysis* is a simple but useful one-function program: it computes the amount of a monthly payment for any amortized loan. The program handles such variables as the amount of the loan, interest rates, and the length of the loan. Its computations are based on a twelve month year, making it more difficult to figure out rates for short-term loans.

If, for instance, you were considering buying a car, you could key in any loan amount with as many interest rates as you liked over an infinite number of years and get the monthly payment you would owe in each case. By doing so, you then have a clear idea of which financial package to take. This holds true for the home buyer and his choice of mortgage. You can show at least ten separate calculations on the screen at one time, which should be more than adequate for most purposes.

The program is a good tool for anyone in a small or medium sized business who is frequently involved with installment sales requiring amortized monthly payments. For example, I can see a strong use for this program in automobile sales or in a real estate office. But once you get it up and running, I suggest you leave it on. Because it comes on a cassette, it takes several minutes to load the program; this could soon become annoying if you use it a lot.

RETIREMENT PLANNING

Company: Advanced Financial Planning

Language: Atari BASIC

Hardware Requirements: 32K

Department: Business

Sugg. Retail: \$29.95

Availability: 3

Disk or Tape: Disk

OVERALL RATING
EASE OF USE
VENDOR SUPPORT

C+
C
B

DOCUMENTATION
VALUE FOR MONEY
VISUAL APPEAL

B-
C
D

RELIABILITY
ERROR HANDLING

C
C-

Retirement Planning is a program for establishing yearly savings requirements in order to achieve a goal of fully funded retirement by a specified year in the future. It can also be used as a tool to help plan toward any large future expense.

Like many "numbers cruncher" type of programs, *Retirement Planning* requires you to do a great deal of time-consuming homework. After you have fed in all the data it requires, it then runs the figures through for you in short order. You must gather and input an extensive amount of financial information based upon current income, assets, expenses, anticipated inflation rates, and retirement expenses. It then provides tables of necessary savings by year to accommodate retirement at the desired future date; in addition, it gives you a yearly breakdown of the growing retirement fund.

The program's error trapping is only fair; that is, if an error is made on input, you are taken back to the previous menu instead of simply being allowed to enter the number a second time. The only other factor which could remotely be considered a detraction is its presentation on screen. The screens are dull and undistinguished. No use is made of the Atari's extensive sound and graphics capabilities; all displays are standard graphics mode zero with the exception of a few changes in the background colors. Nevertheless, I recognize that most people will not be concerned with fancy graphics and sound when planning out a retirement account or their children's college trust fund.

The documentation is complete, although it may take several readings before all aspects of the program are properly understood. For anyone anticipating retirement or needing to lay out a savings scheme for long-term expenses, *Retirement Planning* can prove interesting and informative in terms of financial projections.

Word Processing And Accessories

In order to choose intelligently word processing software for a micro-computer, the prospective buyer should have a good understanding of the concept of word processing, and an idea of what features can go into a word processing system. In many cases, your own word processing needs will determine which features are more important to you, making it imperative to know what you are buying before you invest in a product.

A word processing system can be defined to be a program or collection of programs which are designed to allow a computer user to enter and edit textual matter, stored within the memory of the computer or on some external media (e.g., diskettes), for the purpose of ultimately producing a typewritten document. Word processing's advantages over the lowly typewriter are beginning to make themselves felt in all areas of text handling both in business and in the home. By entering a business letter with a word processor, it is possible to quickly correct minor mistakes, move words, lines, or entire paragraphs around, and perform complicated formatting tasks, without the necessity for hand retyping of each revision.

A typical word processor consists of three major components:

- an editor
- a file manager
- a formatter

Each of these will be discussed separately in the sections to follow, although they may all be parts of a single large program.

THE EDITOR

The editor is perhaps the most important part of a word processing system. It is the editor which provides the primary interface to the user, allowing him to type in text and modify it as needed. A good editor can make word processing effortless, a bad one can make it almost more difficult than using a typewriter. Most micro based editors operate upon a collection of text, held in the memory of the machine, and allow the user to display sections of the text on a terminal, add or insert additional text, change, delete, copy, or move existing text, and scan for selected strings.

There are two major classes of editors: the line oriented editors and the full screen type. Attached to early computers one would always find the popular teletype terminal. This device was essentially a computer driven typewriter, printing messages from the computer on a roll of paper and accepting input from a keyboard. Based upon this device, early editors were line oriented; in other words, input from the user was accepted in the form of a series of lines, each ended by pressing the carriage return key. When the user was not typing input, the computer could send output, also in the form of lines. A line oriented editor is generally command driven, allowing a user to instruct the computer to accept input lines of text, list selected lines as output, delete lines, substitute strings, and scan. The advantages of such an editor are that it can run on almost any terminal, hardcopy or video, and, being command driven, it is somewhat easier to learn to use. The disadvantages are that it is at times hard to find one's place in the text being edited, making changes can be awkward, and lines must constantly be listed so that the user is aware of the changes he has made.

Full screen editors, on the other hand, were based upon the video or CRT terminal. A video terminal allows several lines to be displayed upon a TV-like screen, and, depending upon the terminal, these can be selectively erased or rewritten by the computer, not necessarily in the order that they were originally written. This design allows a full screen editor to "throw" a large number of lines of text up on the screen and through the use of a cursor and cursor movement keys, the user can move around on the screen making changes in the text. Add to this capability special editing commands (usually invoked with control characters), and a very powerful editor is the result.

Many word processing editors are available for micros today, employing both the line and the full screen orientations. In addition there are editors which fall somewhere in between (let's call them command driven screen editors) which are line oriented editors in every sense except that a portion of the screen is set aside to display an updated image of the text after each command. For the purposes of this discussion, though, they may be considered line oriented.

LINE ORIENTED EDITORS

There are several commands one expects to find in a good line oriented editor. Line oriented editors allow the user to refer to a line by either a numbering scheme (such as the BASIC editor) or by a "current line pointer" concept. In the first case, should a user want to list the first twenty lines of text in his document, he might say "LIST 1,20" or list lines 1 through 20. In the second case he would position an imaginary current line pointer to the top of the document (with a TOP command) and then he might issue the command "LIST 20" or list the current line and the lines following up to 20 lines. There is usually a line adding command which, when invoked, allows the user to enter lines of text automatically, one after another. Also, there are commands to delete a line or a range of lines and insert lines (similar to the adding command) between other lines. To facilitate finding a line which needs changing, there should be a scan command which searches the document for a given string, and, once found, a string substitution command, to allow minor changes to a line to avoid retyping it.

In addition to these basic commands, there are several possibilities. A very useful feature is the ability to globally change a given string to another. Suppose you have entered a form letter written to a Mr. Lee. Now you want to send the same letter to Mr. Green but Mr. Lee's name appears all throughout the letter. A global replace command would change all occurrences of the string "Mr. Lee" for "Mr. Green", shifting the remaining text on each line to the right to make space for the longer name.

Another useful command is one which permits copying of a line or group of lines from one place in the document to another. This is done, usually, by specifying the starting and ending line numbers of the lines to be copied and the number of the line after which they are to appear.

With the advent of the CRT some line oriented editors support a "local edit" command. With this command it is possible to ask the computer to list a line of text, placing the cursor upon it for updates. The user may then move the cursor over the line, making selective changes, inserting characters or deleting characters at will, and when the return key is pressed, the modified line replaces the old one in memory. An "edit" command can become the most useful in the line oriented editor's command set.

Other commands can set tabs (as on a typewriter), erase all text in memory to begin entering a new document, and display the amount of memory left in which to enter text. There are also many word processing functions which can be included as commands which will be covered in more detail in the next section.

FULL SCREEN EDITORS

Most full screen editors operate similarly, at least on the surface. A group of text lines is displayed upon the screen and the user may move his cursor around at will to make changes. The screen can be thought of as a window or "viewing port" on the text in memory. Using control commands, the user can move this window around over the text in memory, allowing him access to different parts of the document. In general there can be commands to move the cursor up, down, right, left, to the upper left corner of the screen, the bottom left corner, the end or beginning of a given line, or to preset tab positions. In each case the movement of the cursor does not affect the text in any way. In addition, there might be commands to move the screen window "down" or forward through the document, "up" or backward, and, if horizontal windowing is supported, to the right or left. This latter movement would only be necessary if lines in the document could be longer than the line length of the screen. Commands to move the window to the beginning and end of the document, or to the 31st line (for example) are also useful.

Other necessary commands include a searching capability similar to that in the line oriented editors. When the target string is found in the text, the cursor is left over it to make changes easier. A global search and replace is also a must. It should be possible to delete characters in a line and have the editor shift the remaining characters over to take up the space occupied by the deleted ones. Conversely, an "insert mode" should be provided to allow characters to be inserted in the middle of a line, shifting remaining characters over to make room. In the vertical direction, there is a need for a line delete command and a line insert command or mode as well.

Most full screen editors provide a means for moving or copying blocks of text lines from one place in the document to another. This is usually done by first "marking" the first and last lines to be moved with a special command, saving the block thus marked in an internal holding area, moving the cursor to the new place, and recalling the saved block of text. This mechanism is virtually universal for full screen editors which do not use line numbers.

Other commands can allow for the shifting and tabulating of text, splitting or joining lines, and setting, clearing, and using tabs. Ringing a bell (or beeping) when text is entered past a certain column is also a nice feature. Some editors allow commands to operate on words. A control key might delete the word under the cursor, for instance.

Since there are only so many control keys on the keyboard, it is possible that the editor must operate in different modes. Some editors have a "cursor movement mode" in which the control keys move the cursor or the window. Entering another control key might place the editor in "change" mode, redefining the control keys to have entirely different meanings. In general it is better to avoid this design due to the added complication in memorizing all these commands, but some use of modes should be expected.

Some editors set up for word processing will automatically prevent the splitting of words across line boundaries. This means that as you type, should the last word on a line not fit (as is usually the case) the editor will automatically move it to the beginning of the next line for you. Some editors operate only in this mode, others provide it as an option. Editors which only operate in this mode are at times hard to deal with when you are trying to place data in fixed positions on a line.

Another important consideration in all forms of editors is the handling of upper/lower case. Some keyboards (notably the Apple II and others) do not allow case discrimination with a shift key. Various schemes can be used to get around this. One is to assume all letters entered are lower case and require that upper case letters be preceded by a special character. When the document is "run through" the print formatter program, these two character sequences are replaced with upper case characters. Another, more agreeable way is to use a special key on the keyboard (such as ESC) as a "shift" key and to represent upper case characters on the screen with inverse video (unless an upper/lower case character generator chip has been installed). In either case, it is nice to have a "caps lock" mode as well.

THE FILE MANAGER

Once a document has been entered into the computer's memory via the editor, a provision is needed to save it to disk or tape. The file manager within the word processing package is provided for this purpose. Commands are usually available to load a document into memory which had been previously stored on diskette or tape, or, conversely, save a document which has been entered into memory with the editor as a file on a diskette. A command to list the documents stored on a given diskette is needed, as well as commands to copy, delete, or rename these files. Some of the more sophisticated file managers will allow the user to save a portion of the memory image (lines 250 through 273, for instance) as a file on the diskette, or to load a file from diskette as an insertion into the middle of the document in the editor's memory. Using this feature it is easy to piece together a document from "canned" pre-written segments.

One important consideration when evaluating a file manager is its use of a standard file format. Some word processors use a non-standard format for files, either to provide more efficiency, special purpose capabilities, or to protect the software from being illegally copied. If such a word processor is being considered, the user must ask himself if he intends to use the package for anything other than word processing. If the file manager supports a standard file format (one which can be accessed by Basic or other computer languages), then the editor can be used to type in programs as well as text documents. Also, although many such packages also offer a form letter or mailing list capability, it may be desirable or necessary to interface your own mailing list files, written by other software, to the word processor. Non-standard file formats can also limit your flexibility when it comes to copying files and making backups.

THE PRINT FORMATTER

Second only to the editor in importance is the formatter part of the package. The print formatter accepts as input your edited document (either from the memory image created by the editor or directly from disk or tape) and creates as output a typewritten result on the printer. This may seem very simple, and it can be. Usually, however, the job of the print formatter is quite complex. A good formatter must keep track of how many words will fit on an output line, never allowing a word at the end of the line to be broken in half. It can justify the resulting line so that both the right margin and left margins appear even (more on this later), and it can determine when a page is full, and automatically go to the top of the next page and print a title and/or page number.

In the simplest case, input to the formatter is just pure text lines which are dumped to the printer without change. To cause the formatter to "massage" the text into a more presentable form, the user must insert formatting commands into the text at strategic places. This concept is also used by computer typesetting software (which is remarkably similar to word processing software) and the commands are the "mark-up" language. Thus, the user enters his text and "marks it up" with special commands to tell the formatter when to explicitly go to a new line, where a paragraph is to begin, and when to underline or overprint. In order to better understand the capabilities of a formatter, certain terms need to be defined.

LINE FILLING

Usually, the line length of the editor will not be the same as the final output image (although this need not be true). On a system that does not have a video screen capable of displaying a full 80 columns, a "line filling" technique is most commonly used. To allow for this, the formatter can be made to do "filling" or, to put it another way, it can be put in "fill" mode. This means that, if after moving an input line to the output line buffer, if there is room for more characters on the output device, the formatter fills the output line by "stealing" words from the next line(s). On the other hand, if the output line is shorter than the input lines, the formatter will only use as many words on an input line as will fit, and will use the remainder as the first part of the next output line. Another use for filling is in updating documents. Suppose you have entered a document with the editor but now realize you left out a word. After inserting the word into a line, if filling was not available, you would have to either live with a line that is little longer than any of the others or else retype the remainder of the paragraph. With a filling option it doesn't matter what the input looks like, the output lines will be filled and look normal. When filling, some word processors will "eat" or throw away excess blanks between words reducing down to one blank between words and two following sentences. This practice can be either an asset or a liability, depending upon the types of documents being entered.

JUSTIFICATION

Related to filling is the concept of justification. Lines can be left justified, right justified, centered, or fully justified ("even margins"). Using a typewriter, everyone should be familiar with left justified lines. This just means that the text starts on the left margin and words are separated on the line by one space. Left justified lines have what is called a "ragged" right margin, since it is unlikely that every line will end in the same column. Right justification, rather less useful, is the opposite of left justification. All the lines appear to have been shifted over to the right so that the last character in each falls on the right margin column. A fully justified line is similar to the appearance of typeset material such as one would find in a book. To justify such a line the formatter adds spaces between the words on the line (as evenly distributed as possible) to force the last word to end on the right margin. You could do this on a typewriter but this would require typing the line once, computing the number of spaces to add, and then retyping the line, adding the proper number of spaces between each word. Examples of normal left justified text and fully justified text are shown in EXAMPLE 1 and EXAMPLE 2 respectively. EXAMPLE 2 may appear better than ordinary typewritten text but it is still a long way from the appearance of typeset material. This is largely due to the limitations of a typewriter. An ordinary typewriter (and most computer printers) will "escape" or move the carriage a fixed distance after each character is typed. Thus, the carriage moves the same distance for the letter "i" as for the letter "D". Newer printers, such as the Qume, Diablo, and Spinwriter, allow this "escapement" to be varied, depending upon the last character typed. This is called "proportional spacing". The result is a product much more akin to typesetting (EXAMPLE 4). Since these printers can, under computer control move their "carriage" in very small increments, it is possible to justify lines much more evenly than before also. This practice is called "incremental justification". EXAMPLE 3 is the result of both proportional spacing and incremental justification. At the time of this review there is no word processing software which takes full advantage of these new printers. The closest any comes is in providing incremental justification — none supports proportional spacing.

Getting back to our discussion of word processing formatters, there should be a capability for filling and left or fully justified lines. Some word processors will operate only in the filling mode (it can not be turned off). This can be a disadvantage when tabular information is being entered (especially if the formatter "eats" blanks as mentioned earlier). In general, it is best if data can be entered either as a stream of words to be made into paragraphs, filling with or without justification, or as an exact image of the output (such as a table or chart), with filling and justification off.

Other formatter commands allow the user to specify left and right margins, the number of lines to skip at the top and bottom of a page, the title that is to appear at the top and/or the foot of each page, the position of any page number, line spacing (single, double, etc.), underlining, bold face or overprinting, centering lines, and paragraph indentation. Also useful in most formatters and mandatory in those which insist upon "eating" blanks is the ability to set up printer tabs so that columnar information can be printed.

Some of the more sophisticated word processing systems provide additional formatting capabilities. Among these is a "widow" prevention feature. A widow is a portion of a paragraph, usually only the first line or two, which may appear at the end of a page, with a remainder of the paragraph appearing on the top of the next page. This is considered undesirable. Some word processors will not start a new paragraph if only two lines are left on a page, but will automatically go to the next page. Trailing widows are also possible, but these are a lot harder to eliminate and usually only expensive typesetting software can deal with them.

Another advanced feature is the ability to process a form letter, reading insertions of name and address data into specific places in the letter. Some packages offer this as a separately purchased option, others provide it as standard. Also, some treat form letters specifically, while others allow a more general ability to read "records" from an external file, skip blocks, and loop.

Other features to look for in a formatter include support for special characters which may be available on a printer but not necessarily in the character set of the editing keyboard. Another useful capability is that of turning the formatter's output on or off. Many times, while "debugging" a document, it is desirable to print only a selected portion (in the middle or at the end) while still processing the beginning of the documentation for pagination, etc. This feature can also be used to insert comments to the person editing the document that are not to be printed on the final output. Lastly, some formatters allow commands to pause printing, prematurely abort printing, and obtain strings of text from the terminal for insertion into the documents (example: the document can prompt the person printing it for its output line length).

A final capability which can be much more useful than it might appear is the ability to "proof" a document by running it through the formatter and placing the output on the CRT exactly as it will appear on the printer. This can save paper and time.

A part of each formatter is its interface to the user. The interface should allow the specification of default margins, page sizes, whether forms are continuous or single sheets requiring a pause after each page in spacing, and, most importantly, the address of the printer interface. Some word processing systems will also automatically load the printer interface routine as well. It should also be possible to abort printing at any time.

EXAMPLES

The Association for Computing Machinery (ACM), which has long advocated freedom of expression for scientists around the world, now stands accused of censorship. The brouhaha erupted late last month when the 37,000 member society was accused of "censoring" two candidates' ballot statements for the association's upcoming election of national officers. The accusations were made by present office holders. They have accused the ACM "establishment" of trying to rig the election by this effort.

(2)

The Association for Computing Machinery (ACM), which has long advocated freedom of expression for scientists around the world, now stands accused of censorship. The brouhaha erupted late last month when the 37,000 member society was accused of "censoring" two candidates' ballot statements for the association's upcoming election of national officers. The accusations were made by present office holders. They have accused the ACM "establishment" of trying to rig the election by this effort.

(3)

The Association for Computing Machinery (ACM), which has long advocated freedom of expression for scientists around the world, now stands accused of censorship. The brouhaha erupted late last month when the 37,000 member society was accused of "censoring" two candidates' ballot statements for the association's upcoming election of national officers. The accusations were made by present office holders. They have accused the ACM "establishment" of trying to rig the election by this effort.

(4)

The Association for Computing Machinery (ACM), which has long advocated freedom of expression for scientists around the world, now stands accused of censorship. The brouhaha erupted late last month when the 37,000 member society was accused of "censoring" two candidates' ballot statements for the association's upcoming election of national officers. The accusations were made by present office holders. They have accused the ACM "establishment" of trying to rig the election by this effort.

A Cautionary Word

The programs available for microcomputers vary widely in performance and in cost. None of them will give the micro user all of the capabilities of a \$15,000 standalone word processing system. If you have experience using one of these dedicated machines, you may be disappointed in the performance of even the best of the programs for personal computers. Remember, this machine is a general purpose, low cost machine that allows you to accomplish many different tasks. Word processing is only one of them. The dedicated word processors were designed specifically for this job and provide many extras, including function keys, that are not available on microcomputers.

But if you are not experienced with the dedicated machines you will find most of the programs presently available to be functional, many times more useful than an office typewriter, and considerably more fun.

Choosing A Word Processing System

Depending upon the degree of intended use of the software, one should emphasize either functionality or ease of use. If you plan only occasional use or simple word processing such as correspondence, your primary concern should be ease of use. Price is not always a good indicator of the quality of a word processor. A powerful word processing system with lots of commands could be a burden if you must re-learn it each time you use it. Pay special attention to the degree to which the editor conforms to conventions to which you are familiar in your other uses of the computer. For instance, one word processor uses the return key to move the cursor up rather than the usual downward motion. The occasional user might find this much more of a liability than the same software's ability to add columns of numbers is an advantage. On the other hand, if you intend to do lots of word processing or if you will be entering books or manuals, a more powerful word processor might be a better choice. With extensive use, even the most unconventional editor can become familiar and easy to use; however, one which does not support a formatting function you need, requiring extra effort during editing, can be very limiting. In either case, you should see each piece of software you are considering demonstrated in a way approximating your use before purchasing.

FUTURE WORD PROCESSING SYSTEMS

No overview of word processing would be complete without a look at what the future holds. As good as word processors are now (especially when compared to a typewriter), they can be better, and, having this perspective can make your selection better informed. Most of the following features are now available on word processing or typesetting software for larger computers. There is no reason that they could not be implemented on a micro.

EDITOR

PROGRAMMABILITY — Some more advanced editors allow a limited programming capability. This could be used, for example, to run through the document, looking for a string, and then shifting text around in the lines where it is found.

USER DEFINABLE KEYS — The choice for the function behind a given control character ought to be left up to the user. Also, he should be able to define a key to be a string of characters; a commonly typed word (such as "the"), a string of editing commands, etc.

HORIZONTAL WINDOWING — Most word processors do not need more editor line length than the width of a screen but the use of the editor on other files with various record lengths would require the ability to move the full screen editor's window to the right as many times as is necessary to view the longest line.

TEXT COMPRESSION — Since storage on floppy disks is limited, a useful feature would be to compress duplicate characters (such as several blanks in a row) into a "compressed format" for storage on the disk. When the file is loaded later these sequences can be expanded again.

SPLIT SCREENS — This feature allows the user to divide his full screen editor screen into two or more windows, each viewing a different portion of the file or different files. With a given command he can switch between these windows, giving the effect of having several (smaller) terminals.

FORMATTER

MACROS — This could be the most important of all new features in a formatter. A macro is a collection of formatting information and text, all collected under a single special word. Whenever this word is entered into the text, it is replaced with the text and formatting commands it represents. Use of macros makes the setting up of standard chapter headings very easy, for example. Macros can be written to simplify a complicated formatting command set for a specific purpose, such as legal documents. Macros should be able to accept parameters at the time of their invocation as well (such as the title of the chapter).

TOP/BOTTOM PAGE EXITS — Used in conjunction with macros, this feature would invoke a given macro whenever the top or bottom of a page is reached to allow special formatting.

RECTO/VERSO — This allows a different head or foot title and page number placement for even or odd numbered pages. A capability for ejecting to an even or odd page should be provided so that chapters will begin on a right hand page.

KEEPS — If illustrations or diagrams are to be added after the document is typed, space must be left for them. This space is called, in typesetting terms, a “keep.” Keeps can be as simple as skipping a few lines or as complex as allowing text to “flow” all around a rectangle in the middle of a page. The formatter should also allow for keeping a reference to an illustration on the same page (or its recto or verso page) as the keep for the illustration.

MULTIPLE COLUMNS — It should be possible to specify text to be put into several columns across the page like a newspaper. Doing this is complicated, since widows must be avoided on a column level and keeps must be handled properly.

PROPORTIONAL SPACING — To more closely approximate the look of typesetting on a Diablo printer or its equivalent, software should support true proportional spacing as shown in an earlier example.

INCREMENTAL JUSTIFICATION — Along with proportional spacing, justification should be at the 60th of an inch level with inter-word as well as inter-letter justification possible.

HYPHENATION — To improve the justification of short lines (especially columnar text), a good hyphenation algorithm and exception dictionary for the automatic hyphenation of words is a must.

WIDOWS — Leading and trailing widows should be avoided both on a page and column basis.

SUB/SUPERSCRIPTS — For printers which can handle them, subscripts and superscripts should be supported.

MULTIPLE TYPE FACES — It should be possible to switch fonts or, in the case of a printer, pause to switch the daisy, ball, or thimble for headings and italics.

SPECIAL SYMBOLS — Support for math thimbles for producing formulae may be required.

SPELLING CHECKER — Algorithms and dictionaries could be used to check spelling of common words.

TABLE OF CONTENTS/INDICES — A computer is well suited for compiling an index or table of contents from keywords embedded in the text.

BOXES, LINES, AND RULES — With the graphics capabilities of the Diablo type printers, drawing boxes or lines for tables and charts should be part of the formatter’s command set.

PAGE VS. GALLEY — Most word processors produce pages. A “galley” is a continuous stream of text which is later cut up and pasted-up into pages for reproduction. Although one would expect the production of galleys to be a subset of page production, this is not always the case, since some formatters insist upon skipping lines or sending form feeds.

FOOTNOTES — In addition to superscript support, the footnote information should be made to fit at the bottom of the page on which it is referenced.

REVISION BARS — When revisions are made to program documentation, a vertical bar is sometimes placed in the margin to indicate to the reader where additions or changes have been made since a previous version.

COUNTERS — If several numbered paragraphs appear in a document, it is sometimes better to have the formatter assign these numbers sequentially so that insertions will not require extensive hand renumbering.

ABSOLUTE TABS — This is the ability to tab directly to a column on the line both forward or backward, within the margins or outside of them. This allows the overwriting of a row of periods with text by tabbing back to the beginning of a line to produce table of contents entries, e.g.:

CHAPTER 1 — I AM BORN 1

CHAPTER 2 — I GO TO SCHOOL 15

OUTPUT TO A TYPESETTER — It should be possible to produce an output file on the diskette from the formatter in a format acceptable as input to computerized typesetting equipment. Having this capability can save money when typesetting work is sent out to a typesetting service and reentered there. Since there are many kinds of typesetters and no industry standard for their input, this capability may not appear in micro-based word processing software for sometime to come.

VERTICAL JUSTIFICATION — Just as a line containing words can be justified by adding spaces between words and letters, so a page can be justified by adding small increments of space between paragraphs and lines.

ATARIWRITER

Company: Atari, Inc.

Language: Machine

Hardware Requirements: 16K & Printer

Department: Business

Sugg. Retail: \$99.95

Availability: 9

Disk or Tape: Cartridge

OVERALL RATING **A**
EASE OF USE **A**
VENDOR SUPPORT **A**

DOCUMENTATION **A**
VALUE FOR MONEY **A-**
VISUAL APPEAL **A**

RELIABILITY **A**
ERROR HANDLING **A**

Atariwriter, Atari's new 16K ROM cartridge word processor, heralds a new era in word processing for Atari 400 and 800 owners. It represents a vast improvement over Atari's previous word processor, and even Datasoft's *Text Wizard*. In fact, *Atariwriter* was written by the author of *Text Wizard*. *Atariwriter*'s ability to make writing correspondence or term papers so pleasurable is a good reason in itself to purchase an Atari.

The program is completely menu driven and extremely easy to use. The commands are so simple that after one session beginners will rarely need to refer to the documentation, splendid as it is. Since it can operate in as little as 16K of RAM with a cassette recorder or disk drive, Atari 400 owners can use it. Furthermore, it is the only word processor currently compatible with the Atari 1200XL computer. Since its text files are standard DOS-compatible ASCII files, text files generated on other Atari word processors can also be used by *Atariwriter*. In comparison to its forerunner, the *Atari Word Processor*, *Atariwriter* is much easier to use. In addition, the print preview is nearly instantaneous, and the formatting commands appear as alphanumeric characters right along with your text, rather than as indecipherable graphics Control-characters. Writing is further simplified because it involves only two kinds of screens: the main menu and text editing screens.

Text is entered on a full screen editor 36 columns wide. Words that don't fit on the end of one line automatically wrap around to the next line. Paragraphs are delineated by a Control-P at the start, and continue until a Return key marks the end. The arrow keys are used to position the cursor anywhere on the screen. Editing features include search and replace, block deletions, block moves, and duplications. These all have a failsafe mode to prevent accidental erasures.

Unlike word processors using BASIC, as well as many of the non-Atari word processors, *Atariwriter* types in the insert mode only. Thus, there is no toggle to a type-over mode for simple corrections. A simple correction of a misspelled word like "rin" that should have been "run" requires you to type a "u" before the "i" and then delete the letter "i." This can get tedious, but it tends to prevent the accidental loss of text.

The editor allows you to set margins and indentations as well as right justification, page length, print style (pitch), and paragraph spacing. These values, which are displayed at the top of the screen, can be changed at any time without returning to a separate menu. The parameters are saved with your text. In addition, print formatting commands such as text centering, underlining, subscripts, elongated print, and form printing (leaving blank spaces to be filled in later), can be embedded in your text.

One of the nicest features of this word processor is the print preview. It displays your final document as it will appear on the page. The document is viewed via a "Moving Window" which can be scrolled horizontally and vertically by means of the cursor arrow controls (unfortunately, the four new function keys of the Atari 1200XL will not function as cursor controls). The formatter is faster than that of the *Atari Word Processor*, which took considerable time to do the same job.

Atariwriter currently supports four Atari printers. Epson owners shouldn't panic since the Atari 822 printer seems to work fine. For those of you who have other printers, printer drivers should soon be available from the Atari Program Exchange. These will be available as auto-run files, and integrated automatically when you boot DOS.

With 48K of memory, you have approximately 20K of memory free for your text file. This amounts to approximately 14 double-spaced pages of text in one file. A memory check can be made at any time, which is another handy feature. For longer documents, printing can be chained; all you need to do is enter each filename in the order desired. Multiple short files can be merged until the memory limit is reached. *Atariwriter* can print multiple page documents without requiring manual paper linefeed commands between each printed page, which was a significant drawback to the *Atari Word Processor*. In addition, multiple copies (up to 99) may be printed. Printing is restricted to 132 columns, and attempting to set the right margin beyond 132 results in text being lost off the right side of the page. When using the form printing option (helpful when writing the same letter to several people) you may leave a blank spot for the insertion of a name or different address—up to 35 characters are allowed in each spot. Unlike LJK's *Letter Perfect*, there is no provision for merging a data base to fill in the blanks. You must also keep track of the blank spot entries, as the file won't appear on the TV screen when you are prompted to fill in a blank during printing. However, you can always refer to the copy being printed to see where you are.

In conclusion, *Atariwriter* is a powerful, easy to use word processor, a must for every serious writer and Atari owner. Its cartridge form, while not as durable as a hockey puck, can withstand more abuse than disk word processor programs. At one half the cost of LJK's cartridge (about \$200.00), it's well worth the price.

BANK STREET WRITER

Company: Broderbund

Language: Assembly (BASIC needed for the tutorial)

Hardware Requirements: 48K

Department: Business

Sugg. Retail: \$69.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING
EASE OF USE
VENDOR SUPPORT

B+
B+
B

DOCUMENTATION
VALUE FOR MONEY
VISUAL APPEAL

A-
A-
B-

RELIABILITY
ERROR HANDLING

A-
A

Bank Street Writer is a bare bones, inexpensive word processor that is ideal for novice computer owners and students who need to write correspondence or class papers. Its most attractive aspect is the ease with which it allows you to enter and edit text. The authors have designed an uncomplicated package so that novices can have the word processor up and running in less than ten minutes. There are no complicated series of editing commands to learn, and no complex formatting codes to input. And best of all, there is always a help menu above the eighteen line block of text you are entering or editing.

The program deals with text in two distinct and separate modes on a Hi-Res screen that displays both upper and lower case. The user is normally in the WRITE or CORRECT mode. The cursor cannot be moved about without damage to the text. The two arrow keys are used to erase text before or after the cursor. When the cursor is to be moved in order to make corrections or insertions, the ESC mode puts you in the EDIT mode. The cursor is moved about with the arrow keys. This EDIT mode also allows you to erase or move blocks of text. Any of these modes can be activated by moving the highlighted menu prompt to the appropriate mode, then pressing the Return key. While these blocks are limited to fifteen line segments, larger segments can be shifted in multiple passes. The blocks are clearly highlighted in inverse video, and, if you make a mistake, these segments can be replaced simply by moving the menu cursor at the top of the screen to its opposite (i.e., UNERASE or MOVEBACK.) Since only the last block is in the safety buffer, you must be careful when doing a series of block moves or deletes. In addition, the EDIT mode has the ability of global search and replace.

There is a TRANSFER mode menu that handles all I/O operations. Text files can be loaded or saved to disk as binary files, and disks can even be initialized from this menu. The prompts are adequate, and safety features throughout prevent you from losing data files. Even if you attempt to clear the screen from memory, it asks if you have saved your text. Printouts of your text are also performed from this menu. There is a choice of printing the file as final copy or as a preliminary draft which appears as it does on the screen, thirty-eight characters wide. This option is especially useful for editing.

Although users have fairly good control of the printed format of their documents, including the ability to preview the page breaks and the setting of line widths and spacing, the final printed documents leave something to be desired. First, there is no right justification. While purists will argue that it is useless without proportional spacing in that there is often bad spacing between long words on a short line, it looks cleaner than a badly ragged edge. Remember, because this word processor cannot hyphenate to make words fit better on the line, the ragged edge look is quite pronounced. Perhaps more annoying is the inability to indent the beginning of a paragraph. There is an indent feature, but this only works on a block of lines or until it is cancelled by the first carriage return. It is possible to calculate how many characters are on the first line of each paragraph and then put in a carriage return before continuing the paragraph; but this ruins the spontaneity of writing. Users will have to settle for that modern look of no paragraph indentations. If you need a blank line between paragraphs, simply put in an extra carriage return. The printing process works on any printer and is adjustable in the UTILITY section of this program.

Atari computers with 48K of RAM can only store 1,300 words in memory with this program. For example, this review, which was written using *Bank Street Writer*, is nearly 1,000 words long. Longer files must be saved in segments on the disk. These can be chained together during printing so that it appears there is no break in the text.

The documentation is just as easy to read as the program is to use. It is clear, concise, and logically arranged. There is even a glossary in the back to explain the terms. In addition, the program offers an easy-to-follow tutorial. This, however, requires a BASIC cartridge before it can be used, although the word processor itself does not require one. A second disk, for back-up purposes, has been included.

This program was developed by the Bank Street College of Education and has been extensively field tested

among students of all ages. I think it is a very good choice for students and some older children and adults who need a "bare minimum" word processor that is not complicated to learn or to use. The program is very forgiving if a user makes a mistake. On the negative side, it does not have a very good print formatter. I particularly dislike the design structure. While shifting between the WRITE and EDIT modes eliminates the need for Control characters for cursor movement and character deletion, it makes moving the cursor to change simple misspellings tedious, because often you have to toggle between the two modes. To sum up, the program is user friendly, adequate for small and simple tasks, and inexpensive.

LETTER PERFECT

Company: LJK Enterprises, Inc.

Language: Machine

Hardware Requirements: 24K, disk drive.

Department: Business

Sugg. Retail: \$149.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING
EASE OF USE
VENDOR SUPPORT

B
B
C +

DOCUMENTATION
VALUE FOR MONEY
VISUAL APPEAL

B
C
B

RELIABILITY
ERROR HANDLING

A
B

Letter Perfect represents reasonable value in a basic, easy to learn and use word processor which incorporates a number of special features. It offers a straightforward menu system for easy access to all editing, printing, and file management functions; a full screen editor; and imbedded editor commands for all formatting. Special features include document merging, database merging for form letter production, on-screen format previewing, a safety file locking function, and also support and easy access to special printer characters and functions.

Letter Perfect uses the standard 40 column Atari video screen for data entry. Text that is entered beyond 40 columns is automatically wrapped around to the next line. Lower case characters can be viewed on-screen, accessed through the Shift key. There is also a Shift Lock feature included. The program is compatible with two types of printers. The first is the Atari 825 (similar to Centronics 737/739 printers) and the second is the Epson MX series of printers. Since different configurations are required for each, two versions of the program are provided on the one disk, one on each side. You simply use the side needed for your particular printer.

Letter Perfect's editor uses Control characters for a full range of cursor and text movements, insertions, deletions, search, search and replace, buffer creations, and additions for block text moves, underlining, boldfacing, and so on. Unfortunately, though, there is little apparent logic to the Control characters selected for each command, so memorizing them is more of a chore than it should have been. (However, since the full range of typical editing functions can be performed using a fairly limited number of commands, a relatively small investment of time is required to learn them.) The editor further lacks an easy insertion mode for incorporating additional text in the middle of existing material: you can insert a single blank space or line at a time, but can't instruct the program to automatically move subsequent material ahead to make room for new text. Editor-related functions include the ability to merge any file already on disk to the end of the current file in memory, and to lock files to prevent accidental over-writing.

Letter Perfect offers a complete set of formatting capabilities, which you can assign by imbedding commands in your document while entering text in the editor. These commands enable you to vary from the system defaults (such as pre-set margins, tab stops, etc) established when you configure the program. Since all document formatting is handled in the editor, there are no extra steps needed between editing and printing. This enables you to move quickly from one to the other without any delays. Multiple formatting commands can be entered on a single line, along with comments. These include directions for variable margins and line spacing; headers and footers; page numbering and resetting with optional alternating page position; full justification or left justification of text; centering or right justification of individual lines, headers, or footers; printer supported subscripts, superscripts (super and subscripting are not supported on the MX series of printers); and other special characters or capabilities. Tabs are provided, but there is no automatic paragraph indentation feature. A negative indent is available, but must be requested on each occasion. You can preview formatted documents on the screen from the main menu.

Letter Perfect's most outstanding feature is its database merging capability for form letter and report production. This easy-to-use module lets you merge *Letter Perfect* documents with all or selected records from a database you created either in LJK's Data Perfect database program, or within *Letter Perfect* itself. (Creating a database within *Letter Perfect* is basically a matter of entering data strings in consistent order.)

The program uses its own disk operating system, and includes a module for formatting disks. The disks formatted by the program are to be used for data storage. LJK Enterprises advises against using the program disk for data storage.

The contents of *Letter Perfect's* manual are adequate, but they are poorly organized and formatted for both reading and reference purposes. Some stylistic improvements, type variety, proper headings, and better contents listing are needed to make the current text usable, and to do justice to the program. LJK Enterprises will replace a

damaged disk for \$10 on the first occasion, but charges \$30 for backup copies and subsequent replacements.

Letter Perfect itself lacks some of the more sophisticated features such as hyphenation, footnotes, macros, and indexing) of other word processors in the same price range. It has the virtue, though, of being quick and easy to learn and use. It could be a good choice for a user needing basic functions and form letter production capabilities.

TEXT WIZARD

Company: Datasoft

Language: Machine

Hardware Requirements: 32K, disk drive, printer.

Department: Business

Sugg. Retail: \$99.95

Availability: 5

Disk or Tape: Disk

OVERALL RATING **A -**
EASE OF USE **B +**
VENDOR SUPPORT **B**

DOCUMENTATION **B +**
VALUE FOR MONEY **A**
VISUAL APPEAL **N/A**

RELIABILITY **A**
ERROR HANDLING **B**

Text Wizard is a versatile word processor available from Datasoft, Inc. The program incorporates all of the standard features found on most microcomputer word processing systems, as well as including some nice extras. The program requires 32K of RAM (48K of RAM is recommended for use with large data files), and is compatible with both the Atari 825/Centronics 737 printer and the Epson MX-80. Compatibility with other printers is not mentioned in the manual.

Like the other word processors available for the Atari, *Text Wizard* is broken into two separate sections. The first is the Editor, where the user inputs text and makes any necessary changes. The second is the Print section, which takes the text that has been entered and sends it to a printer to produce the final hardcopy.

The entire program (both Editor and Print sections) are not Menu Driven, as are *Word Processor* and *Letter Perfect*. With *Text Wizard*, the user is required to type in the selection desired from the program. This allows the user to go to any section of the program at any time, without lengthy delays waiting for different levels of menu selections. Users must decide which approach they prefer, the convenience of menu selection or the speed increase offered by a Command Driven system such as *Text Wizard*.

The Editor in *Text Wizard* has been designed to be as easy to use as possible. The screen display for text editing uses the full 40 columns available on the Atari. With *Text Wizard*, all the text that you are entering is visible at one time. When typing, the program will automatically wrap-around any words which have to be split to the next line of text. Using this technique, the user does not need to worry about where a line should end, the program takes care of this.

Text Wizard offers all of the cursor controls which are available on standard word processors. Standard cursor movement (up, down, left, and right) is controlled by the Control key and the four arrow keys on the keyboard. Other cursor controls include movement to the beginning and end of your text, as well as the beginning and end of the page you are currently editing. Also, the program allows for the deletion of individual characters, entire lines of text, and blocks of text. An Insert mode is also included in the program. The implementation of the Insert command is extremely good. By entering the Insert mode, the program automatically moves any text after the current cursor position to make room for the new added text. The wrap-around feature of the program is preserved in this mode, allowing for the continuous insertion of text without worrying about whether or not the inserted text will fit all on one line.

Other desirable features found in the *Text Wizard* editor include the ability to move entire blocks of text from one location to another in your document. This is accomplished by placing the designated piece of text in a special buffer, moving the cursor to the appropriate place in your text, and then inserting the stored piece of text. This feature can also be used to duplicate portions of your text in other places in the document. Another powerful combination of commands are the Search and Replace functions. The Search command, when used alone, allows you to find specific instances of a word or phrase in your document. When used with the Replace command, the two become a very useful editing tool. This combination permits you to change each occurrence of a word or phrase with a new one. When using this function, the program required the user to verify each change, making it very easy to incorporate selective changes in your text. Another very powerful feature is the ability to merge text files stored on your disks, creating documents which include portions from any number of different files.

Overall, the Editor of *Text Wizard* gives the user most of the basic functions required by the average user. It is easy enough to learn that new-comers to computers will be able to take advantage to even the most sophisticated commands almost immediately.

Once your document has been entered in the Editor and any changes that are necessary have been made, it is time to print. *Text Wizard* has default values that control such items as right and left margins, and page length. These values can be changed by inserting formatting commands in the body of your text. The default values may be selected at the beginning of the text, and then later changed by using these formatting lines; or the entire piece of

text may be changed at the very beginning of the print process.

Text Wizard uses dot widths for setting right and left margins. This allows for extremely fine adjustments. Another nice feature is the ability to define headers and running feet to be printed at the top and bottom of each page. The program will also handle page numbering at either the top or bottom of the page. One feature found in *Text Wizard*, which I have not seen in any other microcomputer word processing system, is the program's ability to set a second set of right and left margins, allowing the program to print out the text in a double column format.

One disadvantage in the Print section of *Text Wizard* is that it will only allow you to print from the beginning or middle of a document to the end. You cannot, for example, specify a selected printout of pages 3 to 7 in a twenty page document. Another disadvantage is the inability to specify more than one copy of a document while printing. You must individually print each copy that you want. Aside from these two disadvantages, however, the Print section of *Text Wizard* forms admirably. It even right-justification in the proportional print of the Atari 825/Centronics 737 printers. This extra is something that the word processor from Atari will not do.

The documentation supplied with *Text Wizard* steps the user through an entire editing process. There are clear and understandable explanations of all the system's capabilities. A reference card is also provided, which summarizes the instructions for each command.

Dataseq will allow you to purchase a back-up copy of the program for a cost of \$5.00. Any replacements after that cost \$30.00.

In conclusion, *Text Wizard* is a very powerful, easy to learn word processing system containing most of the features needed by serious users, and is yet simple enough for the computer novice to learn quickly and easily. When the price of \$99.95 is considered, it would be hard to find a word processor which offers so many features for the money.

ATEXT

Company: Elcomp Publishing
Language: Machine
Hardware Requirements: 16K

Department: Business
Sugg. Retail: \$29.95
Availability: 2
Disk or Tape: Both

OVERALL RATING	C-	DOCUMENTATION	D	RELIABILITY	C+
EASE OF USE	C	VALUE FOR MONEY	C+	ERROR HANDLING	D
VENDOR SUPPORT	D	VISUAL APPEAL	C		

ATEXT is a screen-oriented, command-driven word processor from Hofacker Software, a West German Company, and distributed by ELCOMP Publishing of Pomona, California. Although not stated in the documentation, it has less memory requirements than most other word processors for Atari, and should be able to run on 16K systems. It can store text either on cassette or disk in formatted or unformatted form. In the formatted form, one need not use the program disk to retrieve text, as the copy option of Atari DOS (included on the diskette) can be used to copy the file to the screen or printer.

Features of the program include global search and change, movement of blocks of text, right margin justification, text centering, and automatic page numbering (top of page only). The Editor portion of the program utilizes a "Copy Register" for storing blocks of text or formatting commands to be inserted into the text when desired. Printer control commands can be defined and inserted along with the text. For the budget-minded, the program diskette also contains two short programs which enable you to use ELCOMP's printer interface instead of having to invest in an Atari 850 interface.

The commands are extensive and for the most part require the Control key to be pressed along with another. Control-H, for example, is used for backspacing and deleting and is difficult to get used to when the keyboard comes with a key for that very purpose. Text for up to 256 characters per line can be entered. The screen scrolls to the right, but it was easier to review the text by hitting Return after each 35-38 characters. Unfortunately, *ATEXT* has no preview mode (such as in *Atariwriter*), so you cannot see the document as it will appear on the printer. You can format to the screen, but the lines override the margins; and after formatting, the screen automatically reverts to the editor mode.

Despite its positive features, *ATEXT* has five major faults. First, the documentation is mediocre and comes in two disjointed parts—a booklet containing *ATEXT* along with several unrelated program descriptions, and a four-page supplement which tries to clear up the ambiguities. The booklet has pages out of order and includes a portion about ROM burners in the middle of the section on *ATEXT*. There are misprints and typos and only one sample letter. Those not familiar with computers, and word processors in particular, would throw up their hands in despair. Secondly, a MEM.SAV file is present on the diskette, permitting you to enter DOS and return to the program later.

Thus, there is no write-protect tab on the program diskette. Since the disk is copy-protected, you stand a good chance of damaging the program diskette through an inadvertent error. The documentation warns, "Do not use the delivered disks for your own files. It will destroy itself!" Third, there are no provisions for sub-superscripts, headers or footers, and page length is set at the German standard of 72 lines as opposed to 66. A command is supposedly available to correct this latter feature, but I was unable to get it to work. Therefore, you must manually adjust the top margin of each page instead of letting the form feed do it for you. A fourth problem is a real annoyance. Whenever you search and change, or list to the disk, you have to reset the cursor to the beginning of the text. After making corrections in the editing mode, I forgot to do this and erased the entire document from the disk because the cursor was at the end of the text. Finally, on two occasions I tried calling ELCOMP with questions. There is no toll free number, nor are they listed in information. There was a phone number, however, on an enclosed sample letter, but no one was available to answer my questions, and I was invited to try again. Since the author of the program is evidently in Germany, I elected not to try.

If you do not have the money to purchase one of the other first class word processors (such as *Atariwriter*) and an 850 interface module, perhaps *ATEXT* will work for you. With time and effort it can and will do most jobs, and is currently the least expensive word processors on the market.

LETTER WRITER

Company: The Programmers Workshop
Language: Atari BASIC
Hardware Requirements: 32K; printer

Department: Business
Sugg. Retail: \$19.95
Availability: 3
Disk or Tape: Disk

OVERALL RATING	C	DOCUMENTATION	B-	RELIABILITY	B
USEFULNESS	C	VISUAL APPEAL	A-	ERROR HANDLING	B-
VENDOR SUPPORT	B	EASE OF USE	C	VALUE FOR MONEY	B

Basically designed to substitute for a typewriter, *Letter Writer* allows the user to create letters and other short documents and print them out, giving finished documents a "typewriter appearance." As its name implies, *Letter Writer* is not to be considered a true word processor. But, at \$19.95, it does offer a viable alternative for those people whose needs are small and who do not want to spend 5 to 10 times as much for a true word processing program.

Letter Writer allows you to enter text into memory either from the keyboard or from a previously created disk file. With restrictions, the text can then be edited and printed. There is also a special function for addressing envelopes. The program's text editor is basically line oriented. Once a document has been entered, only a minimum of editing can take place. There is no facility for shifting lines up or down within the text to permit major revisions or re-working (i.e., inserting or deleting lines). Even minor editing can become a problem, because line length is fixed at 68 characters. As long as you don't make a lot of typing errors and you don't change your mind about the way you want to say something after it's been typed, these limits should not prove overwhelming. *Letter Writer* does not support any special printing functions, nor is there an option for justifying the right margin.

Overall, *Letter Writer's* capabilities are very limited. However, the authors present the program very clearly. The front cover and the title page of the documentation plainly state that it is not intended to be a full word processing system but stress ease of use and simplicity. The program is menu driven, and makes use of the Atari's graphics and sound generation abilities to add user interest.

Letter Writer represents a decent value for the money; it can be a useful tool for anyone who does not require all the bells and whistles of a full-fledged word processing package.

ATSPELLER

Company: APX/Atari Program Exchange
Language: Machine
Hardware Requirements: 48K

Department: Business
Sugg. Retail: \$39.95
Availability: 4
Disk or Tape: Disk

OVERALL RATING	B-	DOCUMENTATION	C+	RELIABILITY	B
EASE OF USE	B	VALUE FOR MONEY	B+	ERROR HANDLING	B
VENDOR SUPPORT	C	VISUAL APPEAL	C		

Atspeller checks your spelling on any word processor that produces standard Atari DOS text files. Older versions require two disk drives, but newer versions, such as *Atspeller, Rev. 2*, need only one. The program works differently

than its competitors, simultaneously scanning a 30,750 word dictionary and your text file. To limit references to the dictionary, the program stores the 300 most commonly used words in memory and refers to portions of the dictionary only when this fails. This system means that you have virtually no limit on the size of a single disk text file. If you include many words in a personal dictionary, the scanning rate increases from the normal speed (about 180 words per minute).

Output goes to the screen or line printer. The screen method lacks a pause feature. The screen highlights questionable words in inverse, while the printer underlines them with asterisks throughout the double-spaced copy. When you correct words, a new text file is created on disk. Whether you correct each flagged word or skip it, you still need to consult a dictionary. The program dictionary includes many more common words than *Spell Wizard*, for example, and flagged less than half the unknown words in the same test file as the other program did. In addition, you can create your own dictionary, which a sort program arranges alphabetically. Since the program sorts 1,000 words at a time, this must indicate the limit of the user-defined dictionary.

Atspell is fairly easy to work with. Although it does not have a search dictionary feature to be used in conjunction with the correct word feature, it does let you correct your text file with a book dictionary. Since it flags fewer unknown (but correctly spelled) words than its competitor, a casual writer might prefer it.

SPELL WIZARD

Company: DataSoft

Language: Machine

Hardware Requirements: 32K

Department: Business

Sugg. Retail: \$49.95

Availability: 7

Disk or Tape: Disk*

OVERALL RATING **B**
EASE OF USE **B**
VENDOR SUPPORT **B**

DOCUMENTATION **B**
VALUE FOR MONEY **B-**
VISUAL APPEAL **B**

RELIABILITY **B**
ERROR HANDLING **B**

The easily used *Spell Wizard* checks spelling on any word processor that saves output as standard DOS text files. Of the word processors that I checked, only *Letter Perfect* would not work with the program. *Spell Wizard* lets you simultaneously find and correct misspelled words by scanning the text file and locating the unique words. The program then compares these words to the more than 33,000 words in the dictionary stored on a separate disk, plus any words you inserted in a separate dictionary. The text file is reloaded into memory, and displaying three lines at a time, pauses at misspelled words and words not in the dictionaries. The words are highlighted in inverse; you decide whether to correct them or go on. You can either look up the word in a dictionary, or search for it on the dictionary disk. People with two drives will find this handy, but those with one drive have to swap disks each time they look up a word. You can search using a wildcard feature by typing part of the word followed by an asterisk. You see only five words at a time, but can pause by pressing the Space bar. You correct words one at a time and save the entire file when corrections are finished.

The biggest constraint is the limit of 1,000 unique words per text file. If you pass this limit, you must split your file in order to use the program. Another problem is the dictionary. It tends to favor long words over short ones, which helps only if you know how to spell already. Since I don't, I suspect that many of the words not in the dictionary are misspelled and have to look them up to make sure. Of course, you can build an auxiliary dictionary of words commonly used in your writing. You can't delete words, but the documentation implies that your word processor can do this for you. The program does alphabetize the words for you. You can also print out your custom dictionary if you want to keep a record of it. Although the dictionary is not the best I have seen, the number of words stored in one Atari 128-byte sector amazed me. They averaged forty-five words of six to seven letters each. The data compression method is excellent.

Spell Wizard efficiently scans your text files at a rate of 600 words per minute. It may take between two and seven minutes to scan the dictionary disk, depending on the number of unique words. Menu-driven, the program is easy to use and quite helpful to people who write a great deal but need professional-looking manuscripts free of spelling errors.

WORD PROCESSOR COMPARISON CHART

Program	Ratings															
	Overall Rating	Ease of Use	Value for Money	Documentation	Adequate Documentation	Sufficient Examples	Tutorial	Reference Card/Sheet	Formatter Functions	Embedded Commands	Number of Commands	Variable Line Spacing	Variable Page Length	Page Numbering [T] Top [B] Bottom	TITLES [H] Headers [F] Footers	Tabbing
Atariwriter	A	A	B+		Yes	Yes	Yes	Yes	Yes	28	Yes	Yes	T,B	H	Yes	
Text Wizard	A-	B+	A		Yes	Yes	Yes	Yes	Yes	27	Yes	Yes	T,B	H,F	Yes	
Letter Perfect	B	B	C		Yes	Yes	Yes	Yes	Yes	41	Yes	Yes	T,B	H,F	Yes	
Bank Street Writer	B+	B+	A-		Yes	Yes	Yes	No	No	8	Yes	No	T,B	H	No	

Overall Rating: How does the program compare to other available software designed to meet the same needs?

Ease of Use: How quickly can you learn the program?

Value for Money: How does the software's price compare with other comparable programs?

Adequate Documentation: Does the package provide enough information to teach you how to use the system?

Sufficient Examples: Can you follow the program's functions from the "hands-on" examples?

Tutorial: Does the program include its own training section?

Reference Card/Sheet: Does the documentation contain a detachable summary of commands?

Embedded Commands: Does the program contain its own commands?

Number of Commands: A crude indication of overall power and sophistication of formatter and editor.

Variable Line Spacing: Can you change the number of lines per inch?

Variable Page Length: Can you change the length of the page?

Page Numbering: Does the program do automatic pagination on top and bottom, or is it variable?

Page Titles: Can you carry headers or footers for each page automatically?

Tabbing: Is there an adjustable tab?

		<i>Editor Functions</i>	<i>Full Screen Oriented</i>	<i>Right Margin Justified</i>	<i>Number of Commands</i>	<i>Max. Size of File in Memory</i>	<i>Global Search Command</i>	<i>Move/Copy Blocks</i>	<i>Error Recovery</i>	<i>Centering/Justification</i>	<i>Line/Column Counters</i>	<i>Printer Support</i>	<i>Sets Default</i>	<i>Specific Interface Card</i>	<i>Specific Printer Support</i>	<i>File Management</i>	<i>Uses Standard DOS</i>	<i>Multiple Disk Drive Support</i>	<i>Cassette Support</i>	<i>Issues DOS Commands Inside of Program</i>
		Yes	Yes	35	20K	Yes	M,C	Yes	Both	Yes		Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes
		Yes	Yes	28	22K	Yes	M,C	Yes	Both	No		Yes	Yes	Yes		Yes	Yes	No	Yes	Yes
		Yes	No	29	36K	Yes	M,C	Yes	Both	No		Yes	Yes	Yes		No	Yes	No	Yes	Yes
		Yes	No	6	12K	No	M	Yes	Both	No		Yes	No	No		Yes	Yes	No	Yes	Yes

Full Screen Oriented: Can you edit text anywhere on the screen, or is editing "line-oriented?"

Right Margin Justified: Can you set the right edge of the text in one column, so that the text appears as a uniform block?

Max. Size of File Memory: How long can each file be?

Global Search Command: Can the program search throughout the entire document without constant instruction?

Move/Copy Blocks: Can the program automatically shift the location of blocks of text or copy them elsewhere in the document or to another file?

Error Recovery: How easy is it to retrace your steps or to cancel a mistake command?

Centering/Justification: Does the program allow for automatic line or word centering? Will it justify the right margin?

Line/Column Counters: Does the program keep track of how far across and down the page the cursor is located?

Sets Default: Does the program automatically set page parameters and issue printing commands?

Specific Interface Card: Does the program require additional hardware for specific printers?

Specific Printer Support: Does the program support specific printers?

Uses Standard DOS: Does the program use standard DOS commands or does it use other language?

Multiple Disk Drive Support: Does the program allow you to use more than one disk drive? For instance, can you store your text to a different drive from the one containing the program?

Cassette Support: Does the program allow you to write to or read from tape.

Issues DOS Commands Within Programs: Can you use the operating system without exiting from the program?

Mail List Programs

ALOG MAILIST

Company: ALOG Computing

Language: BASIC

Hardware Requirements: 32K

Department: Business

Sugg. Retail: \$39.95

Availability: 5

Disk or Tape: Disk

OVERALL RATING **A--**
EASE OF USE **A--**
VENDOR SUPPORT **B**

DOCUMENTATION **A--**
VALUE FOR MONEY **B**
VISUAL APPEAL **A**

RELIABILITY **A**
ERROR HANDLING **A**

ALOG Mailist is a small database system dedicated to mailing list applications. It is very convenient for handling mailing lists of 130 entries or less (assuming a 48K system), and can accommodate larger lists as well. All operations of *Mailist* are menu-driven. The menus are presented in harmonious colors, and can be used with a minimum of keystrokes. Capabilities include: saving, loading, appending, and merging files; entering, editing, searching, and sorting records; printing records and mailing labels; and other frequently used disk utilities that don't invoke DOS.

All records have the same ten fixed-length fields. In addition to the expected fields for a mailing list, there are fields for code, extra, phone number, and a second street address. The code field is a single character used for classifying records according to any scheme you might devise. Extra allows for up to twenty-five characters of supplementary information useful for sorting or other purposes. The optional second street address field is especially useful for many foreign addresses and addresses with box or apartment numbers.

Data entry and editing is easy, with a few exceptions. Consistent with the program's effort to minimize keystrokes, the cursor jumps to the next field when the maximum field length has been reached. Unfortunately, this leads to a confusing mixture of data entry with and without required Returns. It is easy to skip a field by hitting Return when it is not necessary. A more serious problem for producing good quality labels is that upper case is required throughout. This seems to be an utterly pointless program limitation. Finally, it is hard to keep track of your own "code" field system without a means of displaying them on the screen.

Successive searches can be made on any one field using a full range of logical search criteria. Sorting can be done on up to three fields simultaneously, in ascending order only. The maximum time to sort 130 records on three fields is only about ten seconds. Usually one or two seconds will be sufficient.

File manipulation facilities are provided for handling mailing lists of more than 130 records. You can split a mailing list into segments of the alphabet (or use other appropriate schemes) and handle the list in portions of 130 records or less. Files may be merged, split, or appended to make this type of manipulation as convenient as possible. Handling of large lists could never be as easy with this arrangement as with a single file, but the system does work. A second disk drive is supported as well.

The documentation is complete and clearly written. There is plenty of unimintimidating detail for the novice or non-programmer. On the other hand, technical information is provided to allow more advanced users to access files from BASIC. A business with a huge mailing list and other personal data to manage will prefer a bigger database system, but those with simpler needs will find *ALOG Mailist* easy on the pocketbook and a pleasure to use.

MAGIC MAIL

Company: A Bit-Better Software

Language: Machine

Hardware Requirements: 16K

Department: Business

Sugg. Retail: \$59.95

Availability: 3

Disk or Tape: Disk

OVERALL RATING **B--**
EASE OF USE **B+**
VENDOR SUPPORT **C--**

DOCUMENTATION **B**
VALUE FOR MONEY **C+**
VISUAL APPEAL **C**

RELIABILITY **B**
ERROR HANDLING **B**

Magic Mail is a Machine language mail list program that is fast and easy to use. On-screen menus and commands present some interesting peculiarities. Information like state, zip, and phone number are length dependent, so when you finish one, the cursor automatically jumps to the next, which makes entering zipcodes, phone numbers, and birthdays fast. With an easy form like this, you can easily enter all 400 of your friends, family, and business associates.

Now that you have your file, what can *Magic Mail* do with it? Well, you can "find" a particular entry, or "modify" it. You can print any selected entry or combination of entries, or print mailing labels. You can have more than one database on a disk, so you could create separate files for family, friends, customers, suppliers, or so on.

One of the main functions of a mail list program is its ability to sort your file (usually on the Name field). This brings up one of those peculiarities I mentioned earlier. *Magic Mail* sorts on the beginning of the Name field, so if you've listed your entries with first name first, that's how it will be sorted. You'll have Bob Smith before Ted Adams. If you list your names last name first, you'll get a conventional alphabetical listing, but the labels will be printed as Smith, Bob.

The sort function is memory dependent. The number of entries you can sort breaks down as:

16K	58
24K	153
32K	248
40K	343
48K	439

If you're planning on using *Magic Mail* for business purposes, 439 entries may not be enough. You'd need to break up your file into two or more databases, such as Customers A-J and Customers K-Z. The Sort and Find features are both extremely fast thanks to the Machine language programming.

One of the more unique features of *Magic Mail* is its ability to dial a telephone number for you by simulating the tones the phone company uses for Touch Tone service. After retrieving the desired file you simply hit "D" on the keyboard while holding the phone's mouthpiece next to the TV speaker. This feature won't work if you have Dial Pulse lines. And here is a related oversight in the program—*Magic Mail* will not dial "1" and then your long distance number. This brings up another point. When you're filling in the data form for someone in your area, you must leave the area code blank if you want to use the auto-dial feature.

There are a couple of things I would like to see in *Magic Mail* that, given its price, could be included. One would be a "Memo" line for little notes such as "good customer" or "never pays on time." Another would be the ability to have two phone numbers for each file so both business and home phone numbers could be included.

One final note. There was a mention in the computer press of a bug in *Magic Mail*'s sort routine. I couldn't find it, but you might want to contact A Bit-Better Software before purchasing *Magic Mail* to make sure you get the debugged version.

MAIL LIST

Company: MMG Micro Software

Language: BASIC and machine

Hardware Requirements: 48K

Department: Business

Sugg. Retail: \$39.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING C-
EASE OF USE B
VENDOR SUPPORT B

DOCUMENTATION B
VISUAL APPEAL C
ERROR HANDLING C

RELIABILITY B
USEFULNESS C
VALUE FOR MONEY C

Mail List is a completely menu driven and so user friendly mailing list program capable of creating, editing, sorting, and printing files. Each diskette can store up to 705 entries. Each entry is assigned a file number, and is divided into six categories: Name, Address1, Address2, City/State, Zipcode, and phone number.

One limitation of the program is that it is only capable of searching for entries by name and/or corresponding file number. Since there are five other categories available for conducting searches, the shortcoming is noticeable. On the other hand, *Mail List* incorporates a feature that allows you to search for a name beginning with a certain letter or letters. For example, if I were trying to locate a name beginning with the letter "J," I would input that letter and all the names beginning with that letter would sequentially appear. Mind you, it would be better to be able to search for the first letter(s) of the last name rather than the first name.

Mail List has a sorting utility that allows you to sort entries by any of its six entry categories (although not all six at a time in different sort orders). Although single drive systems require switching between the data disk and the program disk when sorting, the routine is written in machine language. This makes the overall sort relatively quick.

The print function outputs either to the screen or to a printer. The printer option can also produce extra spacing between labels. In addition, it can suppress printing phone numbers, which is a nice feature. Unfortunately, the print

function makes no provision for envelope printing (at least in the updated version of the program), which is a severe limitation.

According to MMC Micro Software, *Mail List* is compatible with any printer. This is rather too generous a claim, although I have not personally tested the program with all of the printers available on the market. I use a Gemini-10 printer, which has the same command codes as the Epson MX-80. My printouts were satisfactory, but for some reason the program would flag an error after printing. So much for compatibility. Finally, *Mail List* has no merge print function. Combining addresses and letters is only possible by first running *Mail List*, and then running your own word processor program separately.

In conclusion, the program has some positive features: it is menu driven, it can search for names beginning with a specified letter, and it offers a fast sort algorithm. However, the program also has limitations. Too often I found myself rebooting the program due to a lack of proper error trapping. *Mail List* could have been more useful if it at least had the ability to print addresses on envelopes.

MAILING LIST

Company: Atari, Inc.

Language: BASIC

Hardware Requirements: 24K disk drive or cassette, printer optional.

Department: Business

Sugg. Retail: \$24.95

Availability: 7

Disk or Tape: Both

OVERALL RATING
EASE OF USE
VENDOR SUPPORT

A -
B +
B +

DOCUMENTATION
VALUE FOR MONEY
VISUAL APPEAL

B
A -
A

RELIABILITY
ERROR HANDLING

A
A

The name of this program, *Mailing List*, is something of a misnomer. The program really has capabilities that extend beyond its use solely as a mailing list keeper.

To begin with its mail list capabilities, the program will accommodate a name list in the following fashion:

LAST _____
FIRST _____
MIDDLE _____
STREET _____
AREA _____

CITY _____
STATE _____
ZIP _____
PHONE _____
EXTRA _____

The "EXTRA" field can be used for any kind of identifying phrase you might desire. For instance, if you were a salesman and were using this program to keep a customer list, then this field might be used to identify the specific product that the customer purchased, an area of interest, or some other significant note.

Information that you have in your list can then be sorted based on any of the fields. For example, you could print out a list of just those customers that reside in California; or only those customers who purchased a specific product.

Also included in this package is another program which essentially is a variation of the *Mailing List* program called "General List." With this program, you may make up any kind of a customized list you might desire. You may wish to build a list to keep track of your record collection, recipes, coins or stamps, or anything else. However, the program will only allow up to 6 characters per field, and up to 10 fields per "index card."

Although this package can be used with either a cassette or a diskette, a diskette is infinitely more efficient, as in any kind of information storage and retrieval program. In general, this package is a good one, though there are a few criticisms:

(1) It is not apparent, either in documentation or in the program just how much information can be stored on cassette or on diskette.

(2) Sorting can be done on only one item at a time. For instance, if a multi-field sort were available for our example of a customer list, then we could ask for and receive a list restricted to California customers who bought a specific product and are in a specific zip code area. With this program, we would have to make at least three separate lists to obtain this information.

(3) The process by which sort criteria are selected is somewhat awkward and should be simplified.

In sum, criticism notwithstanding, this is a good program. The average buyer should find sufficient uses for this program to justify its purchase.

MAIL LIST

Company: Artworx

Language: Atari BASIC

Hardware Requirements: 16K

Department: Business

Sugg. Retail: \$39.95

Availability: 3

Disk or Tape: Disk

OVERALL RATING **D**
EASE OF USE **D**
VENDOR SUPPORT **C-**

DOCUMENTATION **D**
VALUE FOR MONEY **D**
VISUAL APPEAL **D**

RELIABILITY **C**
ERROR HANDLING **C**

There are two ways to make a computerized mail list. One is to use a general data base management system and custom design your own program. The other is to buy a program that is designed for the sole purpose of compiling a list. *Mail List*, from Artworx, is of the latter category, and, unfortunately, it is not a particularly good program.

Entries can be retrieved by name, keyword, or zipcode, and then written to a printer or another data file. The program will print address labels one, two, or three across; and it will only sort alphabetically or by zipcode. Each function proves to be a chore to use.

After booting up, you must specify a file name when the flashing "Option" prompt appears. There are no menu driven user prompts; to continue, you must have the instruction manual to guide you. By entering "O" at the prompt, you will see a display of the acceptable commands.

To begin a new file you must type "Start," and name your file. You are then greeted by a question mark asking for input line by line. The first line is for a three character search/sort key (e.g., you might use "FAM" for all of your relatives, or "BUS" for your business associates). Keys can have more than three characters, but must be multiples of three (6, 9, 12, etc.).

The second line is for a name, which must be entered last name first, followed by a coma and then the first name. Next is the address line on line three; then city, state, and zipcode on line four. Line five can be used as a "memo" line for a telephone number, birthdate reminder, or whatever. Line length and the number of total characters per entry seem to be variable, limited by the Atari itself (125 characters per line?); but once you have set the specifications, it may not be altered.

Not only is editing an entry difficult, if you wish to add names to your file you must use the "Add" mode. If you use "Start" by mistake, you will erase your previous entries. Deleting old entries is also troublesome. You can only flag them for deletion. This leaves them in place, but denies you access to them, and only when you transfer the entries to another data disk will these entries actually be omitted and the space made available.

One of the most important features of any data management system is its Sort function. The program will store up to 500 entries on data disks. (It is not made clear in the documentation, but apparently the program will store a total of 1,500 mail list entries if you have a full 48K on your Atari.) But *Mail List*, limited to available RAM for sorting, can only handle a few hundred at a time. If you want a large list sorted, you must break them up on several disks (e.g., A-J, K-R, S-Z). The program sorts alphabetically; but it uses the ASCII values of the characters, so upper case letters will sort differently than lower case. You must be consistent throughout your list, using either all capital letters or capitalizing the first letter followed by all lower case. If you break this rule—and it is easy to forget when adding entries at different times—your lists will not sort correctly.

If you want a sorted list printed out, you must choose the Print option before the Sort option because the program doesn't automatically save the sorted list for you. For later use, you can specify that a sorted list be sent to another file for recall as needed. You must plan ahead for using either method, because once the sort process begins you cannot change options.

There is a "Dup" option that is supposed to eliminate double entries. But the program will only compare entries that are next to each other in the file. If the name and zipcode is the same, it assumes that the second entry is a duplicate and drops it. If your double entry is not next to the original, the program does nothing. It seems that this option is of dubious value at best.

Mail List's search options allow you to search on Key, Name, or Zipcode (single criterion or a range). Print options can be appended to a search to give a printout of the found items. There is an Edit option to change existing records.

I found *Mail List* hard to use. Since it is not menu driven, I had to refer to the instruction manual constantly in order to keep track of what I was doing. This gets irritating. The manual is small, 6" x 8.5", xeroxed, and not easy to read. The program dimensions each record as it is input, which means that if you want to change "Smith, Jonathan" to "Smith, J.", on the printout it will look like "J. Smith," leaving in the "omitted" spaces anyway.

For the price Artworx is asking, I cannot recommend *Mail List*. Save up a few more dollars and purchase one of the really useful data base management systems that you can configure for a variety of needs, including a mailing list with print functions.

Database Management Programs

The exact meaning of "database management" varies according to the level of sophistication being sought, what kind of database you want to create, and how you want to use the information you store in it. There are three basic levels of sophistication among present database programs, ranging from the simple to the highly complex. Their functions and prices vary accordingly.

In the most general sense, a database is simply a collection of information organized in a particular way for one or more purposes. One simple database we all use is a telephone book. It contains names and phone numbers, and is organized alphabetically so that it is easy to look up someone's phone number. Dictionaries, catalogs, and library file cards are also examples of databases that we use regularly.

A computerized database management program accepts, organizes, and stores information, manipulates it in various user-specified ways, and reports the results. The database program for you should be the one which most closely handles the data the way you'd like it to.

The simplest database is a fast, electronic version of a basic index file card system, such as has been handled traditionally in an address book or small box full of 3" x 5" cards. If that's how you've handled your needs in the past, then a relatively inexpensive and simple file manager program of limited flexibility will probably serve. At the "middle" level of sophistication and price are those programs which offer you a fair amount of power and considerable flexibility, yet are still easy to use. With them, you should be able to format data storage and manipulation in various ways to meet different needs; and they should be able to store, sort, edit, retrieve, and calculate data, as well as produce reports in different ways (various kinds of graphs, charts, alphanumeric reports, etc).

The first two levels are basically file managers; they are only able to retrieve and manipulate selected items from a pre-defined file. At the expensive "high" end of sophistication are relational databases. These systems have the ability to link together elements from a number of different files in the same database. Yet, while these programs are powerful in coping with a variety of informational needs, they make no pretense about being easy to use. In some cases they are virtually programming languages for creating customized databases.

A database consists of files. Each file is made up of different records, and each record is made up of "fields"—individual units of related information. Let's say, for example, that you were creating an address book, a file limited to business clients. Each unit of information—name, street address, city, state, zip code, telephone number—is a separate field of data. These fields, linked together, form one record in the file. Within the database, you could create several files, one for business addresses, one for friends, one for relatives, and so forth.

What, then, should you be looking for in a database? One obvious feature is ease of use, ease in designing file formats, and other user-oriented operating features. You'll simply have to try out a few (or look at demonstration versions) in the store.

Another feature is the reliability and size of your data storage capabilities. Are there backup procedures? Are there checkpoints for system failures? How many files of a given size can the program handle at one time?

Flexibility is also an important factor in selecting your database program. The area of greatest concern is the ability to reformat data in various ways, both the ways in which you add information and obtain printed output from it. You'll also want flexibility with "default options." Programs often come from the publisher with preset data entry formats and other features that come up automatically (that is, "by default"). You should be able to change the default values (the standard setup of the program) to meet your individual requirements.

You should also check the program's arithmetic capabilities. For example, along with adding, subtracting, multiplying, and dividing, can your database perform exponential calculations?

The ability to edit and sort data is also an area of concern. What can you change? What are the decimal specifications and monetary formats available? How is the sequencing of records performed? Can you sort files in ascending and descending order? And when you're sorting, can you use more than one field at a time as search criteria? Can you specify multiple fields, string values, or a range of records numbers when conducting searches?

Finally, there are some other features to look for in databases, depending on your needs:

- *reporting capability
- *file expansion (which allows for virtually unlimited file storage capacity and sorting ranges spread out over multiple diskettes)
- *modification capability

- the ability to match, merge, or update with two or more files
- indexing capability
- master file extraction for building other files with shared data
- the ability to interface with other kinds of programs.

Whatever database you choose, remember that the accuracy of the output will not exceed the accuracy of the information you enter into the program.

DATABASE COMPARISON CHART

Program/Vendor	Price	Number of Records		Characters per Record	Number of Fields	Field Length	Disks per File	Need for Second Drive	Sorts by Any Field?	Sorting Levels	Multiple Key Searches	Record Number Displayed	Sample Data File	Prints Reports [R] & Mailing Labels [L]	Language
Data Perfect, LJK Enterprises	\$99.95	511	696	32	127	1	Mod.	Yes	4	Yes	Yes	Fair	L	Machine	
File Manager Synapse	\$99.95	2,000	512	20	100	12	High	No	3	Yes	Yes	Fair	R,L	BASIC/ Machine	
File Fax TMQ Software	\$129.95	879	1,005	31	40	1	Low	No	8	Yes	Yes	V.Good	R,L	Machine	
CCA DBMS CE Software	\$99.95	249	800	24	110	64	High	Yes	10	No	No	Difficult	R,L	BASIC/ Machine	
Data Base/ Report APX	\$22.95	255	800	10	100	64	High	Yes	10	No	Yes	None	R	BASIC/ Machine	
Data Management APX	\$22.95	140	700	8	30	60	Low	Yes	8	No	No	Good	R	BASIC/ Machine	

Number of Records: How many individual records (discrete user-defined groups of information) can be kept in one file?

Character per Record: How long can each record be?

Number of Fields: How many separately defined portions of each record can there be?

Field Length: How long can each separately defined portion of a record be?

Disks per File: How many floppy disks can be used to contain the records of a single file?

Need for Second Drive: Does the program require two disk drive to function?

Sorts by any Field: Can you rearrange the file according to the information contained in any user defined field?

Sorting Level: On how many fields can the program sort with only one set of instructions

Multiple Key Searches: Does the program locate information for you according to several criteria simultaneously?

Record Number Displayed: Does the program tell you where the information with which you are working is located according to its own bookkeeping?

Sample Data File: Does the package include a disk with a sample file stored for your instruction?

Language: In what language is the program written?

CCA DATA MANAGEMENT SYSTEM

Company: CE Software

Language: BASIC and Machine

Hardware Requirements: 40K

Department: Business

Sugg. Retail: \$99.95

Availability: 5

Disk or Tape: Disk

OVERALL RATING **C+**
EASE OF USE **B**
VENDOR SUPPORT **B**

DOCUMENTATION **B-**
VALUE FOR MONEY **B-**
VISUAL APPEAL **D**

RELIABILITY **A**
ERROR HANDLING **B**

The *CCA Data Management System* is a general purpose data base and record keeping system. It is useful for such applications as small business record keeping, stock portfolios, home inventories, and even payroll records. The report generation module of the program is flexible, allowing for the generation of customized reports (including mailing labels). The program also provides backup and checkpoint procedures to assure data reliability.

Program functions are selected by the use of menus. Some of the functions are: file definition, file maintenance, printing customized reports, data base compacting, and the sorting or merging of data files. File definition is done on a field by field basis. For each field you want included in the file you must specify a field identifier (maximum of five characters), a field description that will be displayed when the data is typed in or printed out (maximum of fifteen characters), and a maximum field length. The *CCA Data Management System* supports alphanumeric, numeric, permanent, and computed field types. The field types are specified with the field identifier. For example, a numeric field identifier will have an asterisk in front of it during definition. Computed fields consist of numeric identifiers with mathematical symbols between them. Thus, the computed field for the total cost of an auto repair job TCOST, could be set up as $TCOST = PARTS + LABOR * HOURS$, where PARTS is the cost of any auto parts installed, LABOR is the cost of labor per hour, and HOURS is the number of hours spent on the job. When LABOR, HOURS, and PARTS are entered, TCOST is automatically calculated. Computed fields may contain the operators +, -, *, / and ^ (exponentiation). Expressions are evaluated from left to right, and parentheses are not allowed.

Field lengths may not exceed 110 characters, while record lengths have a maximum of 249 character. Up to 24 fields per record may be defined. Once file definition is complete, you can enter data into it. The program displays the field description as a prompt for input.

For record retrieval or inspection, you can directly retrieve a record by using the record number (the record number of the tenth record you added is 10, the fiftieth is 50, and so on), or you can sequentially scan the file with a full or partial search key. The fields display in the same manner in which they were added. During record inspection, you can mark a record for deletion. The record can later be reclaimed by the update function if the file has not been compacted since the record was deleted.

The sort/merge facility uses a "scratch" disk for temporary storage. Files with similar record definitions can be stored. Files with similar record definitions can be merged together and sorted. The sort module allows you to sort up to 10 fields in either ascending or descending sequence for each field. According to the documentation, the current revision (4.1) produces a sort time of approximately 5 minutes for a sort of 100 character records with 10 sort fields.

The report facility allows the printing of either reports or mailing labels. For reports, subtotals on columns and summary reports are allowed as well as titles and headings. Once a report format has been defined, it can be saved on disk for re-use. Deleted as well as existing records can be printed. The report facility allows only one search category for a specified report.

The manual is in tutorial form with a section on messages and errors. Most of the useful information is found in the message section, which can be hard to find unless you have just received the message while using the program.

The program is inadequate in several ways. Using the record number as index is awkward, and not as powerful as being able to specify a particular field or fields as the index key to a file. Because of this, the sequential scan feature had to be used more often, and scanning for a record at the end of the file can be maddeningly slow for large files. The program doesn't make use of the standard Atari features, such as screen editing, multi-color graphics, background colors, or sound. Any of these would serve to enhance the interaction between the program and the user.

The *CCA Data Management System* provides the same basic features as other database programs in its price range, but the lack of definable index keys and Atari features make it less appealing.

DATA BASE/REPORT SYSTEM

Company: Atari Program Exchange

Language: BASIC and Machine

Hardware Requirements: 40K, Disk Drive

Department: Business

Sugg. Retail: \$24.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING
EASE OF USE
VENDOR SUPPORT

B -
B -
C

DOCUMENTATION
VALUE FOR MONEY
VISUAL APPEAL

B +
A
C

RELIABILITY
ERROR HANDLING

A
B

Data Base/Report System is a small data management program. The program's capabilities are similar to those in *Data Base Management*, also sold by the Atari Program Exchange. *Data Base/Report System* defines numeric fields, and produces reports that can summarize such fields over the records printed on the report. This makes it suitable for the storage and retrieval of investment data, such as stock or real estate portfolios; it might also be used to compute the value of coin or stamp collections. The size of the data base is limited to one disk, but the program does allow you to use a second disk drive for the data disk.

Program functions are selected from a main menu. The functions include the following: updating a file; printing standard reports; initializing a new file; printing customized reports; utilities; and changing the date and drive used for data. Both the record creation and the record display are field oriented. When you create a new file, you are prompted to enter the field heading and field type, one line at a time. The entire format is never displayed. If you exceed 255 characters, an error message is displayed, and you must start over to create the file. After the format is created, you can later add fields at the bottom, lengthen or shorten fields, or change field headings. Fields cannot be deleted. When you enter data into a record, the screen displays the fields sequentially in the order entered; and records are similarly stored on disk as they are entered.

The memory maintains a key which can be formed from up to three fields, sorted in ascending or descending order. The disk fields are accessible using Atari DOS. When printing, deleting, or changing records, a variety of search criteria are allowed on each of the three key fields. Temporary keys can be created in RAM to facilitate searching the data base; these do not interfere with the permanent keys that are stored on the disk.

Only three fields are displayed on the screen at a time. This poses a serious limitation when you try to read the records on the screen. The program also includes a global-field change function, which changes the same field in a large number of records. Select the records by using the search function, but remember that only the selected field is displayed on the screen for updating.

The program provides both vertical and horizontal report formats. The vertical formats may be printed in two columns, and the horizontal formats are well designed. A printed field width is the larger of the heading length or the field length, and these fields appear in the order you select. The same data base can thus be searched and printed in a variety of different formats. Be advised that the maximum allowed width is 121 columns.

The data base can be modified to print with an Epson printer. This modification involves listing 36 lines of BASIC code to the screen, and changing the printer Control characters on each of these lines. The appendix lists a table of 825 Atari Control character functions; however, the Epson Control characters are not listed.

The manual describes the operation of the program very well. A glossary of data base terms would have been useful, since a person unfamiliar with file management terminology may have some difficulty understanding the instructions.

I'd recommend this program for small data base applications that require summing up numeric fields, or that want some versatility in formatting the printed reports.

DATA PERFECT

Company: LJK Enterprises, Inc.

Language: Machine

Hardware Requirements: 32K, disk drive

Department: Business

Sugg. Retail: \$129.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING
EASE OF USE
VENDOR SUPPORT

A -
B
C +

DOCUMENTATION
VALUE FOR MONEY
VISUAL APPEAL

B -
A
B

RELIABILITY
ERROR HANDLING

A
A

Data Perfect is a very professional disk-based file management system. The program is extremely versatile, allowing many sophisticated features. The user can define his own screen format for entering data. Fields may be placed anywhere on the screen, and reports have a similar formatting flexibility. The program is suitable for most filing applications that are appropriate to perform on a microcomputer. The file is limited to the storage capacity of one disk.

The program is menu driven, with the main menu providing a selection of program functions. At each point in the program, an Option line presents the abbreviations for the allowed commands; but the abbreviations are not contained in the index, and a new user will frequently have to page through the manual to find the instructions for the options. The sophistication of the program is also its major drawback for the new or infrequent user in that it involves many more commands and options than are found in the other data management programs available for the Atari Computers.

The data is apparently stored in sorted order on the disk. The disk files are not accessible using Atari DOS 2.05. Typically, several hundred records can be stored on a disk. Several thousand small records are possible. The first field in the upper left corner of the screen provides a key field for sorting. Data searches span up to four fields, using at most two criteria per field. Moreover, subfields can be marked for merging with the *Letter Perfect* word processor, also marketed by LJK Enterprises.

The screen format should be carefully planned before you create a new form. Field types include the following: alphabetical, numeric with fixed decimal options, formulas, and date fields. The most common mathematical functions are allowed for the formula fields. Long fields wrap-around and extend into the left margin — a minor annoyance. The fields are identified by a preceding character to remind you of the type of data to enter, and the cursor moves from field to field as you enter the data. Full screen editing is not available, and is probably not desirable with this type of data entry.

This program provides the best report customization available for the Atari computers. A seven line heading and two lines of detail per record are permitted, text may be included in the detail, and up to nine lines of detail can be accommodated under the label option. The screen scrolls horizontally over an 80 column width, so that the page may be set up on the screen in exactly the same format as it will be printed. The program also provides convenient customization for use with different printers. A very nice feature is its ability to save several report formats for printing future reports.

The format can be completely redefined after data has been entered. Fields can be added or deleted, their length and screen position changed, and new formula fields added and redefined. The merging operation is complicated, because you must direct each field by number from the old data base into the new data base. The manual does not say whether or not the formula fields are computed during the merging process, and I did not test the function. The manual itself is tutorial in form, and I found it moderately difficult to follow. In many places the tutorial format bogs down in details. It contains a large index, but there is no quick reference to the command prompts that appear on the screen. The main menu functions are contained on index tabs on the pages of the manual.

Data Perfect is recommended for data that will benefit by either its excellent screen formatting, or its report formatting features. It is not appropriate for small or moderate data bases that do not need the sophistication provided here.

DATA MANAGEMENT SYSTEM

Company: APX/Atari Program Exchange

Language: BASIC and Machine

Hardware Requirements: 32K, disk drive.

Department: Business

Sugg. Retail: \$22.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING	B	DOCUMENTATION	B +
EASE OF USE	B	VALUE FOR MONEY	A
VENDOR SUPPORT	C	VISUAL APPEAL	B

RELIABILITY	A
ERROR HANDLING	B

Data Management System is a small data management program with limited features. It is suited for the storage and retrieval of short records, such as telephone and address directories, and home inventories. A summary report can be printed for records retrieved by searching the data base. The size of the data base is limited to one disk, and the program uses only one disk drive. You are advised to copy the program onto a newly formatted disk before using it.

The program is completely menu driven, a feature which works very smoothly. Easy to follow prompts on the screen direct you through the procedure of setting up a data base. Only eight fields are allowed, and a record may not exceed 140 characters. You are prompted to enter the headings, field length, and field type one at a time on the screen. After the data dictionary for the data base is created, you can only change a field heading, or delete the entire data base.

Because of the small size of each record, you must be careful to plan each field. I recommend that you define the data base characteristics on paper *before* entering them into the program. Enter only a few test records and experiment with these before you begin to work with a large number of records only to find that the format is unsuitable.

When you type data into a record, the fields are displayed one at a time in the order received. Requiring you to enter a value for every one of these fields is an annoying feature. For instance, you must enter a value into a date field reserved for a future event (such as the date you expect to sell a stock), even though a null value is appropriate.

Records are stored on the disk as they are entered. They can later be sorted on one field in ascending or descending order. You can sort fields in sequence, and maintain earlier sorts — a useful feature if, for example, you want to catalog record titles in alphabetical order under composers that are also in alphabetical order. The disk files are accessible using Atari DOS.

The program provides a simple list format for printing the results. You can select the fields, but they will appear in the order that you entered them into the data dictionary. The format is nicely designed with a title, page number, and column headings. The maximum width is 130 columns. You must change one line of code in the program to use an Epson MX-80 printer.

The manual is very easy to follow. It steps you through each example, using a sample data base provided on the original disk. The program, finally, is best recommended for very small data base applications.

FILE MANAGER 800 +

Company: Synapse Software

Language: Atari BASIC and Machine

Hardware Requirements: 40K, disk drive.

Department: Business

Sugg. Retail: \$99.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING
EASE OF USE
VENDOR SUPPORT

A
A
B

DOCUMENTATION
VALUE FOR MONEY
VISUAL APPEAL

A -
A +
A

RELIABILITY
ERROR HANDLING

A
A

Filemanager 800 + is an excellent disk-based file management program, providing great versatility in storing and retrieving information. Applications include mailing labels, stock portfolios, recipe files, home inventory, business inventory, and several others.

The program is menu driven, and commands are selected from one of several full-screen menus or from abbreviations displayed in a "command line" at the top of the screen. This ensures that you are never left wondering what to do next. Normally, pressing the Select key will return you to the last menu.

As records are entered into the file, an index key is updated and the record is stored on the disk. The maximum capacity is one file per disk (typically, several hundred files can be stored on a disk). The key contains characters from as many as three fields, allowing rapid random access to records which are searched for using these fields. Searches on other fields require each record to be read from disk, and this is a fairly slow process. You may redefine the index, but this again takes some time. However, searches using the new index will be considerably faster.

Creating fields and entering data is exceptionally easy with *Filemanager 800 +*. Field names can be up to twelve characters long. The fields and types are entered in a single list when you create a new form. The field types, among several, include: alphabetical, numerical, dollars and cents, number repetition, alphabetical repetition, and computed dollars and cents. The excellent screen editing capabilities of the Atari are used to correct errors, both while defining the fields and while entering data into the records. You may compute field entries from other fields, using not only the standard arithmetic functions but also more advanced functions such as trigonometric, square root, absolute value, and so on.

When entering data, the field names are displayed on the left of the screen and lines delineating the field follow. If you press the Return key, the cursor moves to the beginning of the next field, skipping over computed fields. After completing the data record for an entry, press the Start key to enter that record. The computed fields are now evaluated, and the results displayed on the screen. This process is slow and will annoy a professional typist.

A very useful feature in *Filemanager 800 +* is its ability to completely redefine the form after you have entered data into the records. This is very important if you have typed in several hundred records, and find that you need a new field or a different computation. In the re-definition process you can add and delete fields, change field sizes, and rearrange their order on the form. You can also convert numeric fields to any other type of numeric field, but they cannot be converted to alphabetic fields or (vice versa). There is a serious defect in this conversion process. If you define a new computed field, the program does not automatically compute the values of that field for each record. You must instead display each record on the screen, enter the update command, then re-save the record. This is a very tedious task if you have a large data base. Plan ahead and be sure that you have correctly included all computed fields when you create the form the first time around.

Reports can be generated by searching the file using search criteria on up to four fields. You can specify which fields and the order of the fields to be printed. If the heading is longer than the field, the heading is truncated. Printer controls select type fonts, spacing, and character size for most printers. The printer control for condensed print for the Atari 825 printer is given incorrectly on page 100 of the manual. The correct sequence is: <ESC> <ESC> <CTRL> <T>.

A very useful feature for reports is the program's ability to sum up a numeric column. For example, this can be used to compute the value of a collection, or an investment portfolio.

The manual is tutorial in form and very easy to follow; the main menu items are listed on index tabs. Its main drawback is the lack of a comprehensive index.

The program, finally, is highly recommended for file systems containing a few hundred records or less.

FILE-FAX

Company: T.M.G. Software

Language: Machine

Hardware Requirements: 48K

Department: Business

Sugg. Retail: \$29.95

Availability: 6

Disk or Tape: Disk*

OVERALL RATING
EASE OF USE
VENDOR SUPPORT

A-
B
B

DOCUMENTATION
VALUE FOR MONEY
VISUAL APPEAL

A-
B+
B+

RELIABILITY
ERROR HANDLING

A-
A-

File-Fax, an excellent disk-based file management program, emphasizes easy use and foolproof data entry. This combination ideally suits the casual computer user or the clerk/secretary likely to use the program once the database is defined. The ability to store a database on up to four disks (assuming you have four disk drives) allows for very large databases. In fact, the program's ability to compress data lets you store a thousand 100 byte-long data records (100K) on an 88K disk. You design databases on a full-screen editor using all of the Atari's screen editing features. The final format chosen appears on a single screen. You define each of as many as thirty-one fields as having a specific number of characters, specified on the screen by brackets. After designing the screen format, you specify the attributes of each file. This lets you specify the data entry as alpha, numeric, plus/minus signs, blank spaces, dollars and cents, yes/no, or any combination of the above. You can also leave the attributes open so that the field will accept any kind of data. This gives you the advantage of idiot-proofing the process of entering records. The computer beeps if you try to enter an alpha character in the phone number space, for example. You design the attributes at the same time that you define the data entry page. The Control-arrow keys move the cursor from field to field, while moving the \diamond keys over a one-line list at the bottom of the screen selects attributes. The Return key verifies your choice while the Space bar negates it. You can also define up to eight specific sorts on a field at this time.

You can easily search for and revise records, searching by exact name or by wild card on any field or group of fields. Multiple wild cards are allowed. You can search by match or by range. Supposedly, you can print any record on your line printer by pressing the CTRL Shift @ keys, but I couldn't get this feature to work. I suspect a problem with the multi-machine documentation. The output to the printer or screen looks like a row-column report. The screen is eighty columns if you use an eighty column printer, and scrolls left as you move the cursor beyond the normal range. The ESC key toggles between the record format display and the report format display. Each field is transferred one at a time from the record format display to the position desired in the report format display. The CNTR T key makes the transfer. Naturally you can correct any misalignments with the Atari's screen editing keys. You can save up to four different report formats to disk with this program.

A label making feature proves helpful for mailing lists. You can instruct the program to suppress trailing blanks so that the first and last names follow each other without unsightly gaps.

The documentation consists of a large tutorial. While a good learning tool, it is not very convenient for later reference. The main fault lies in its general reference to five or six specific machines. Although a one-page list shows specific differences between machines, the manual always refers to specific control keys that work by default. The documentation also fails to make clear the capacity of the system.

The program proves useful for producing simple databases or mailing lists. It does, however, have numerous limitations. A stand-alone package, it cannot interface to other packages such as *VisiCalc* or word processors. It also lacks the ability to redefine the database and thus prohibits the addition of more fields. It possesses limited mathematical function capabilities. Its main advantages are its easy use, good input error checking, large number of fields, and ability to sort to great depth.

No one database will suit everyone. *File-Fax* is certainly no better or worse than its competition, so in considering it you must decide if it or another database closely matches your specific needs.

THE HOME FILING MANAGER

Company: Atari, Inc.

Language: BASIC

Hardware Requirements: 16K, disk drive. Printer and drive optional.

Department: Business

Sugg. Retail: \$49.95

Availability: 9

Disk or Tape: Disk

OVERALL RATING **B+**
EASE OF USE **B+**
VENOOR SUPPORT **B+**

DOCUMENTATION **B+**
VALUE FOR MONEY **B+**
VISUAL APPEAL **B+**

RELIABILITY **A**
ERROR HANDLING **A**

The Home Filing Manager is a well documented and easy to use program intended for the beginning computer user. The graphics, what there are of them, are clear and sharp. The upper and lower case characters are easy to read even on a 10" television screen, and are even crisper on a color monitor. The program itself is similar to having a file box that can store addresses, recipes, or other minor filing items. In fact, the layout on the screen is that of a lined file card. A limitation of the program is that you can fill up a card with information (i.e., a recipe), but once you have reached the end of the card it will not continue automatically onto another card for the same file. The reason for this is that the program will sort entries sequentially for information only on the first line of the card. If your first card starts with an "S," and the second card started with an "R" the "R" card would automatically be filed in front of the first card marked "S."

The program will also allow you to sort by titles or specific phrases in an entry. If the user wishes to sort by a specific phrase, the program will flag the card with that phrase with a graphic "paper clip," which will then allow you to go through all cards and review those with the "paper clip." This can be handy indeed if you have a large amount of cards and are looking for a specific item; for example, an ingredient in a recipe like marshmallows. Any recipe in your file that had marshmallows would be flagged with the "paper clip," and assist you in finding the particular file you wanted.

The program has the ability to insert letters, phrases, or complete lines. With a simple keystroke you can add or delete files. For the suggested retail value of this program, this reviewer feels that the enduser is presented with good value for his/her money with a fast utility home program that has many potential, although limited, applications.

MMG DATA MANAGER

Company: MMG Micro Software

Language: BASIC & Machine

Hardware Requirements: 32K

Department: Business

Sugg. Retail: \$49.95

Availability: 4

Disk or Tape: Disk

OVERALL RATING **B-**
EASE OF USE **B**
VENOOR SUPPORT **C**

DOCUMENTATION **C**
VALUE FOR MONEY **B**
VISUAL APPEAL **B**

RELIABILITY **A**
ERROR HANDLING **B-**

MMG Data Manager, a small database management program with limited features, best suits the storage and retrieval of short records (up to ten fields) such as telephone and address directories, home inventories, and mailing lists. You can print a summary report for records retrieved by searching the database, which occupies one disk. The program can use two disk drives and probably should to avoid frequent swapping of program and data disks.

The program is completely menu-driven and features a colorful Main Menu. The menus work smoothly, and easy-to-follow prompts direct you through the procedure of setting up a database. Although the manual does not specify the maximum length of a record, each record holds only ten fields. Prompts tell you to enter headings and field length one at a time on the screen. I found the absence of a cursor during data entry annoying, because if I looked away from the screen I lost my place. Another problem is that you cannot change any of the information after creating the data dictionary for the database. If you have pressed Return when entering data, you must begin all over again to correct a mistake in the field data. Because of the small size of each record, you must carefully plan each field. The documentation recommends that you define the database characteristics on paper before entering them into the program. You should enter only a few test records first and experiment with the format before you type in a large number of records. When you enter data into a record, the fields appear one at a time in the order entered.

Records are stored on the disk as you enter them. Later you can sort them in ascending or descending order, sorting all fields simultaneously. A five character "key" remains in memory for each of the ten fields allowed. The access time for any record is short, typically less than one second. The disk files are accessible using Atari DOS.

The program provides a simple list format for printing results. A special print format allows you considerable freedom in formatting the printed output. You can select the items in any order and have them printed beside the previous item or on the next line. The format includes a twenty-character application name and date. The maximum width is 130 columns. The technique used to obtain condensed print on the Atari 825 printer as described in the manual did not work. In general, however, I found the manual very easy to follow.

Stock Market Programs

BOND ANALYSIS

Company: Atari

Language: Atari Basic

Hardware Requirements: 24K Atari 800, disk drive; printer optional

Department: Business

Sugg. Retail: \$24.95

Availability: 9

Disk or Tape: Disk

OVERALL RATING **B -**
EASE OF USE **B**
VENDOR SUPPORT **B +**

DOCUMENTATION **B**
VALUE FOR MONEY **B -**
VISUAL APPEAL **B +**

RELIABILITY **A**
ERROR HANDLING **A**

Atari's *Bond Analysis* program represents a fairly useful tool for fixed income investors. The program is comprised of two sections:

(1) **Bond Yield** - This will give you the total yield of a bond held to maturity. It also includes the current yield. Entering the call date instead of the maturity date will give you a yield to call.

(2) **Bond Price and Interest** - This feature presents you with the correct price an accrued interest for a specific bond when given the annual coupon payment, redemption price at maturity, time to maturity, and the desired rate of return.

The program does not, however, allow for such niceties as calculating yield after taxes, or equivalent taxable returns, which would obviously be important for doing a true bond analysis. I found this too limiting for so complex a subject, and so I cannot give it an unreserved recommendation; but, recognizing that at present there are few other choices for Atari owners interested in doing bond analysis, I would certainly say that the program is worth looking into.

Within its limits, the program is fairly simple to use. Documentation is somewhat better than average, and includes a glossary and bibliography.

FINANCIAL ASSET MANAGEMENT SYSTEM

Company: Atari Program Exchange

Language: Atari BASIC

Hardware Requirements: 40K, disk drive, printer recommended.

Department: Business

Sugg. Retail: \$29.95

Availability: 9

Disk or Tape: Disk

OVERALL RATING **C**
EASE OF USE **B**
VENDOR SUPPORT **C**

DOCUMENTATION **B**
VALUE FOR MONEY **A**
VISUAL APPEAL **C**

RELIABILITY **D**
ERROR HANDLING **D**

Financial Asset Management System is a program designed to evaluate asset portfolios of items such as stocks, bonds, cash assets, real estate, or virtually any other monetary-based asset. Its functions are: (A) to input information forming an asset portfolio and storing that info on disk (i.e. name, cost, quantity, expected annual yield, etc.); (B) to calculate yields, profits, new quantities and costs by virtue of dividend re-investment; and (C) to print out this information, with appropriate subtotals and totals, in various forms such as asset reports (alphabetic and magnitude), dividends year-to-date, and a user-customized data input form. A full data file print form is also available for troubleshooting.

F.A.M.S. performs its functions in a usable but rather rudimentary form. Although menu driven and fairly user-friendly, the program becomes unclear and complicated in some places. The data input routines do their job, but are rather inflexible and aesthetically unpleasing. The sample forms included in the documentation look nice, but on two of the Epson printers tested with the program, the output came out messy and incorrectly spaced. On an ATARI 825 printer the output would probably be more acceptable.

F.A.M.S., in comparison with other programs which perform comparable functions, is a good value for the money. However, there are some inconveniences with using the program. For instance, the Break key is enabled, and if pressed inadvertently, the program exits to BASIC, most likely losing all the updates in that session. Furthermore, if the printer is not on-line and a report is attempted, the program will bomb out into BASIC instead of advising the user that the printer is inactive. Another funny error occurs if the user gives one of the data files the same name as one of the programs, thereby erasing that program on that particular diskette. Frustrating!

Aside from these problems, *F.A.M.S.* is a fairly useful program, once you learn the bugs and how to avoid them. It presents a fair value for the price, and could be an asset (if you'll pardon the pun) if used carefully and correctly.

STOCK ANALYSIS

Company: Atari
Language: Atari Basic
Hardware Requirements: 24K

Department: Business
Sugg. Retail: \$24.95
Availability: 9
Disk or Tape: Disk

OVERALL RATING **C**
EASE OF USE **C**
VENDOR SUPPORT **B+**

DOCUMENTATION **C**
VALUE FOR MONEY **B-**
VISUAL APPEAL **A-**

RELIABILITY **C-**
ERROR HANDLING **D+**

Stock Analysis evaluates stock portfolios by using statistical measures, figures the annual rates of return for investments, and calculates the intrinsic value of a stock by computing the discounted present value of estimated future dividends.

There are three primary sections to this program:

1) Portfolio Analysis — This performs evaluations using statistical methods such as arithmetic mean and standard deviation of log returns, and geometric mean of period returns.

2) Stock Rate of Return — Computes the annual rates of return, compounded annually, for specific investments.

3) Stock Dividend Analysis — Applies the Nicholas Molodovsky method of computing the present discounted value of the estimated dividends. It will also calculate the length of time a growth rate must be maintained, or the price/earnings ratio required for equating the intrinsic value to the current market price.

This program can only be recommended for sophisticated long-term investors who are thoroughly familiar with mathematical models for computing statistical parameters, rates of return, and present value. Although formulas are given in the reference manual, there is no explanation of their meaning. The terminology is very confusing. For example, the "holding period" is defined as a specified period of time in which the investor plans to hold an asset; but you must enter prices and dividends for each holding period. This confuses past and future activity.

Error-trapping could be much better. At one point this reviewer tried to add data to a portfolio and received the error message that the diskette was full. But in fact 127 sectors were free on the disk. At another point, your input data is lost if you forget to chose the save option from a menu. Some caution is advised in considering this one.

STOCK CHARTING

Company: Atari
Language: Atari Basic
Hardware Requirements: 24K Atari 800, disk drive

Department: Business
Sugg. Retail: \$29.95
Availability: 8
Disk or Tape: Disk

OVERALL RATING **C+**
EASE OF USE **C**
VENDOR SUPPORT **B+**

DOCUMENTATION **B**
VALUE FOR MONEY **B-**
VISUAL APPEAL **C+**

RELIABILITY **B**
ERROR HANDLING **B**

When it comes to stock market investing, even if you're a die-hard fundamentalist (i.e. one who believes that the future course of stock prices relies primarily on their underlying value, or earnings), graphing stocks can still be a useful tool for you. The Atari *Stock Charting* program, for the most part, adequately performs its task.

For each stock (and up to 50 stocks may be recorded), the program asks for:

- 1) The ticker symbol.
- 2) The last 4 quarter earnings (optional).
- 3) The last 4 quarter dividends (optional).
- 4) Daily volume.
- 5) Closing quotes (high, lows).

In return for this information, the program will provide you with a clearly organized graph. In addition to the actual graph, the screen will display the calculated price/ratio, stock yield (if applicable), earnings for the last 4 quarters, and dividends for the last 4 quarters. The bottom of the screen will display the low and high for the stock along with the beginning and final day that has been graphed. Up to 120 trading days may be viewed on the screen in this manner. The graph itself displays high, low, and volume. A 10 day moving average and a 6 day oscillator may also be imposed on the graph.

The only major complaint that should be voiced is the fact that the entry of information is, at best, awkward and unnecessarily cumbersome. Screen menus could also be improved.

Additional features that would be nice in this type of program might include some elementary record keeping functions aside from the graph information. And, like most similar programs on other computers, a Dow Jones link-up option for retrieval of information via the phone lines would be welcomed. Documentation is adequate, but could stand further expansion.

Stock Charting is relatively tedious to use. It is configured for one disk drive only, and you must continually exchange the program and data disks as you use the modules. The closing quotes must be typed into the program, and there is no provision for correcting a value after it is entered. The manual states that "once a disk is full, the files are locked and no more data can be added." The overlaid graphs are difficult to read because of the colors chosen. There are a large number of relatively slow disk manipulations in several of the modules.

STOCK MANAGEMENT

Company: APX/Atari Program Exchange

Language: BASIC

Hardware Requirements: 32K

Department: Business

Sugg. Retail: \$24.95

Availability: 9

Disk or Tape: Disk

OVERALL RATING

C

DOCUMENTATION

C

RELIABILITY

B-

EASE OF USE

B

VALUE FOR MONEY

B-

ERROR HANDLING

B

VENDOR SUPPORT

A-

VISUAL APPEAL

B

I've always disliked checkbook managers; I never saw an advantage to entering every transaction twice (once in the checkbook, then in the computer). It's much faster to use the checkbook ledger and a calculator. Followers of the stock market, however, do not have a ledger for transactions. Greg L. Thrush's *Stock Management* may not be the best answer. While it successfully crunches numbers and maintains lists, it runs very slowly, is not error-proof, and presents difficulty in expanding the program's storage files.

Stock Management records all transactions and information concerning price, broker's fees, splits, dividends, and the date bought and sold. Menu options will correct existing transactions, make new ones, list all transactions, allow status (price) updates, and determine the profit or loss of a given stock or year. With 32K the program can list 150 transactions. 40K will allow 300 transactions, but the user must break into the program and rewrite one line. Presumably, 48K is good for 450 transactions, but the instructions make no mention of this. It would have been far better if the program had PEEKed the amount of available memory, determined the number of transactions possible, and reminded the user how many were left after each new entry.

Should the user accidentally select the new transaction option, there is no way to change short of entering false data or halting the action by pushing BREAK or SYSTEM RESET. In addition, following certain input a message containing the number of transactions flashes by too quickly to be read, but visibly enough to mislead an unwary user into thinking something has gone wrong. The program also displays a series of "Current Holdings Files," each numbered and sporting a randomly colored background. These are not explained in the instructions. How are they used, and why does the program create more of them as transactions are entered?

Stock Management comes on an unnotched disk. Since information is written to disk, the program must be copied onto another. This technique guarantees a back-up copy. The program also comes with a sample file which demonstrates the style of entering transactions; the only way to delete this sample is to abort the program, enter DOS, unlock two files, and delete them.

Because it is written in BASIC, program access is relatively easy, but the running speed is slow. The idea behind *Stock Management* is excellent, but the program itself is not well designed. It could use a revision 1.2.

General Business

THE SOURCE

Company: Source Telecomputing

Language: N/A

Hardware Requirements: 48K, modem, printer

Department: Business

Sugg. Retail: \$100.00

Availability: 10

Disk or Tape: N/A

OVERALL RATING

B-

EASE OF USE

C

VENDOR SUPPORT

B

DOCUMENTATION

A

VISUAL APPEAL

C

ERROR HANDLING

B

RELIABILITY

B

USEFULNESS

A

VALUE FOR MONEY

B-

The Source is a timesharing system, rather than a specific program, for the microcomputers. With this system, you have access to a large number of programs and databases housed in several mainframe computers located in Virginia. The \$100 price noted above is the sign-up charge, which gives you a manual and a password. In addition to this, there is a \$10.00 per month subscription fee and hourly charges which vary by time of day, data storage fees, and baud rate used. Both 300 and 1200 baud are available through the local TYMNET or TELENET data network. *The Source* is a subsidiary of The Reader's Digest Association, Inc.

There are many features of *The Source*. These include several modes of communication: electronic mail, chat (realtime conversations), post (a public bulletin board), voicegrams, and mailgrams. The information services included: *Source*Plus* (added cost features), business databases, shopping by catalog, education and careers, government and politics, home and leisure, news and sports, science and technology, and finally, travel, dining, and entertainment.

*The Source*Plus* features *Media General*, a way of obtaining historical and current performance comparisons for common stocks. The commodity *News Service* tracks activity in the major future markets. Management Contents, Ltd. makes abstracts available from 27 business publications. *Comp-U-Star* is a discount catalog electronic shopping center.

With the business programs you are able to access current stock information and create portfolios that may be kept up to date on a daily basis. In addition to those functions available through *Source*Plus*, the *Unistox* database of UPI is available. Command files will access this database automatically. For general information, *The Source* accesses the UPI business news and obtains opinions from Raylux Financial Services. In addition to the *Comp-U-Star* database, you are able to use the *Source* to barter, order records and tapes, order books, and get tapes of classic radio programs. There are educational programs ranging from simple counting drills to sophisticated computations in math and science. Methods of obtaining college financial aid are on *The Source* for callup. Finally, for employers to access, there is a database of resumes of people looking for work. You can keep track of the government on a daily basis through many of the UPI entries. If you wish, you may even set your computer up as a teletype and get a running UPI newswire on your desk (of course, computer hookup costs will be running!). Further, many games may be played through *The Source*. There is also a home medical guide where you respond to a variety of general questions and the computer returns descriptions of various ailments. Should you be interested in traveling, *The Source* can help you plan your trip. Both international and domestic air schedules are in the system. When you have your trip set up, there is a travel club through which you make your reservations and get the tickets via regular mail. Once at your destination, use *The Source* to find a good restaurant or learn about what local wine to order. For after dinner entertainment, you may consult *The Source* for the latest movie reviews. If you are interested in doing something out of the ordinary, *The Source* allows you to create your own files and programs in several languages. Text editing may also be performed, with very professional results. Some users offer other services, such as typesetting, so using *The Source* you can write, edit, check for spelling, and then transmit to a typesetter. You will be returned a camera ready copy of your work. *The Source* also encourages public use of the system for information exchange. To that end, they have set up a public area where users establish "magazines." As other users read the material, the original publisher is credited with a royalty from the reader's usage fee. *The Source* is now experimenting with a computer conferencing capability termed *PARTICIPATE*. It is only now in the experimental stage, but promises to provide users with common interests a forum for conferencing and exchanging ideas.

COMPUSERVE

Company: Compuserve Communication

Language: N/A

Hardware Requirements: 48K, modem, printer helpful

Department: Business

Sugg. Retail: \$39.95 + \$6.00/hr.

Availability: 10

Disk or Tape: N/A

OVERALL RATING **B**
EASE OF USE **B**
VENDOR SUPPORT **B**

DOCUMENTATION **D**
VISUAL APPEAL **C-**
ERROR HANDLING **A**

RELIABILITY **B**
USEFULNESS **A**
VALUE FOR MONEY **A-**

Compuserve Information Service is a subscription service which any microcomputer owner can use if he has a modem and has received his password from a Compuserve representative. Like *The Source*, *Compuserve* has a one-time subscription fee. At the present time, the fee for a non-prime time user is only \$39.95, and thereafter you are charged \$6.00 per hour for on-line service. Non-prime time is reckoned to be after business hours, or after 6 pm in your particular time zone.

The hourly fees of *Compuserve* are less than those charged by *The Source*, and *Compuserve* does not charge a monthly minimum, as *The Source* does. At the time of this review *Compuserve* had more subscribers, less expensive rates, and faster response time than *The Source*—and yet remains less well-known. In addition, *Compuserve* gave three free hours to every subscriber when he first signed on. (It isn't clear, however, whether this "free time" policy will be continued indefinitely.)

Compuserve offers similar services to those of *The Source*: electronic mail, electronic catalog shopping, education, games, Dow Jones updates, word-processing, entertainment—in fact, over 1,200 different functions are available to subscribers. These services are all easy to access and use on *Compuserve*. One feature that *Compuserve* offers which *The Source* does not is a simulation of "CB" radio channels. People on the service can talk to each other via keyboard, just as CB radio users do over the airwaves. The user has over 30 channels to choose from and can talk to anyone across the continent who happens to be on the "CB" at the same time.

Compuserve users must re-subscribe to the service if they wish to have the ability to use the *Compuserve* Services during the day. At the time of this review, *Compuserve* subscriptions were available through Radio Shack stores (or call direct toll free, 800-848-8990, if you are interested). The reference manual for *The Source* is a model of good documentation, and unfortunately *Compuserve's* users' manual falls far short of this ideal. But, like *The Source*, *Compuserve* makes extensive use of help menus which more or less make the reference manual unnecessary.

Currently, *Compuserve* appears to be very good value to the microcomputer owner looking to explore the realm of telecommunications and information service networks.

MINI DATABASE/DIALER

Company: Santa Cruz Educational Software

Language: BASIC

Hardware Requirements: 16K cassette/32K disc

Department: Business

Sugg. Retail: \$24.95

Availability: 5

Disk or Tape: Both

OVERALL RATING **C**
EASE OF USE **B**
VENDOR SUPPORT **C**

DOCUMENTATION **C**
VALUE FOR MONEY **C**
VISUAL APPEAL **C**

RELIABILITY **C**
ERROR HANDLING **D**

Many database applications require a large, complex program with sophisticated features. Such features, although powerful enough to make performing the big jobs right, can make the small, routine data storage tasks much more complicated and expensive than necessary. The *Mini Database/Dialer* is specifically designed for such moderately sized jobs as handling a personal mailing or telephone list, a car expense record, limited household inventory, and so on. Once the user has established his databases, any of them can be searched for a specific string, or an identified record can be displayed and printed. The contents of one field in each record can be added to or subtracted from a cumulative total. Another feature allows a telephone number to be automatically dialed by the computer on a touch-tone phone system (although the method for doing so, holding the phone up to the computer's speaker, is primitive in the extreme). The program offers these capabilities both in a cassette version and on disk.

The main menu boots itself automatically, but the "Ready" prompt prematurely lingers for quite a while during the loading process. If an anxious user presses a key in response to the "Ready" prompt, the program randomly jumps into any point on the menu when loading is actually complete. Several levels of menus are used to interact with the databases. Creating databases, searching records, editing, printing, and otherwise manipulating information are all accomplished in a streamlined and straightforward manner. No sorting facility is provided. The BASIC search

routine is slow, with a noticeable delay between the appearance of records. In addition, all records of a given data base are held in RAM at the same time (as DATA statements in the program), so a 16K system will be severely limited in capacity. RAM is used efficiently, however, since the records are of variable length (up to 101 characters).

One serious bug is that, when changing a record, a space is inserted at the beginning of each field in that record if you are using a label longer than eight characters; so if enough changes are made, the entire contents of a record would be shifted to the right all the way off the screen and deleted. The field length requirement is not made clear in the documentation. Another irritating problem involves the "check printer" prompt, which appears when trying to output to an inactive printer. The program abandons the record you wanted to print and returns to the menu. If you forget to turn on the printer, you must search for the record twice. It is also too easy to forget to save changes to your data base on disk, because there is no prompt reminding you to save the file before exiting from the program.

The documentation is friendly, with plenty of detailed instructions and examples. One sample file (only on the disk version) contains 182 Atari references, a good start on an Atari programming data base. While the printing is a little sloppy, the six page loose-leaf manual reads easily. One minor error in the documentation states that System Reset has been set up to reboot the program; instead, System Reset works in the usual manner. A not-so-minor problem is the claim that mailing labels can be made from the files. The entire contents of a record, including the phone numbers, additional data that may be included, and the field names themselves, are printed. There seems to be no provision for printing a partial record or suppressing the field names. Don't expect it to print any address labels.

Mini Database/Dialer can be a handy little program, especially for users with cassette systems. It is limited, but adequate for many small jobs. The record editing bug must be fixed, however, before anyone can get full use of the program.

PROPERTY MANAGEMENT PROGRAM 2000

Company: T & F Software Company

Language: BASIC

Hardware Requirements: 48K; printer; VisiCalc

Department: Business

Sugg. Retail: \$219.95

Availability: 3

Disk or Tape: Disk

OVERALL RATING
EASE OF USE
VENDOR SUPPORT

B+
A
B

DOCUMENTATION
VALUE FOR MONEY
VISUAL APPEAL

A-
B
B

RELIABILITY
ERROR HANDLING

A-
B

Property Management Program 2000 (P.P.M.) is a *VisiCalc*-template for recording the status of apartment units, tenant information, billing, and many other transactions involving the management of apartment buildings. Naturally, in order to run *P.P.M.* you must already have *VisiCalc* and be familiar with its functions and operations.

The program is very easy to use. *P.P.M.* comes on four disk templates which are used to record transactions for as many as 100 different apartment units. You may record such data items as square footage, appliances and fixtures for each apartment, among other items. *P.P.M.* also allows you to include brief background data on each tenant, including name, telephone number, first date of occupancy, monthly rent, next rent increase, last time he/she paid rent, partial rent payments, and any outstanding monthly balance. One welcome feature of this program is that when tenants get behind in their monthly rent, as sometimes happens, you may send a printed invoice stating the tenant's outstanding balance and indicating that the rent is past due. The four templates also include a distribution of expenses and bank account statement in which you can record your bank balance, and all income and payments made on your apartment complex(es).

I found some of the columns, such as "furniture rent," not very useful for my own managerial applications. But *P.P.M.* allows you to customize some of the titles in the same way as you can with *VisiCalc*.

P.P.M. runs well, and the documentation is thorough. The user's manual takes you through a tutorial on each template, so that even relatively new computer users (who have a working knowledge of *VisiCalc*) will feel at ease with this program. After running it a few times you will not need to consult the manual much at all. Another good feature of *P.P.M.* is that you may make back-up copies of the four master templates used for storing data, ensuring against damage to the master templates. Back-ups of the master disks should be made, as T & F Software charges \$20.00 per replacement should one of them perish.

A few drawbacks to this program, and to *VisiCalc* in general, are that only 40 columns can be viewed on-screen at one time, and that some of the data from other templates must be retyped into other templates. Nevertheless, overall *P.P.M.* is an easy and efficient way to record the continuous transactions involved with owning and managing apartment units.

ELECTRONIC NOTEBOOK

Company: Amulet Enterprises, Inc.

Language: Atari BASIC

Hardware Requirements: 24K

Department: Business

Sugg. Retail: \$29.95

Availability: 2

Disk or Tape: Disk

OVERALL RATING **C**
EASE OF USE **C+**
VENDOR SUPPORT **B**

DOCUMENTATION **B-**
VALUE FOR MONEY **C-**
VISUAL APPEAL **C**

RELIABILITY **C**
ERROR HANDLING **C**

Electronic Notebook, essentially a doodling pad, tries to do too much. A special graphics set allows limited drawing capability, but it is not a graphics package. You cannot change from black and white, choose between a joystick or light pen, or vary the texture of your drawings. You can dump your drawing to the printer, save it on disk, and intermix drawings and the graphics 0 character. You can also set up tables with labeled columns and update them as needed. You can set up a mailing list, but the program will not alphabetize it or check for double entries. The program includes a string search feature, but it doesn't work for title and column headings. The search string when located appears at the top of the screen. You can review subsequent screens, but not previous ones, and cannot even return to the beginning of the current screen. Error handling is mediocre. If you accidentally tell the program that you have more than one disk drive when you only have one, it crashes. Indicating end-of-file (Control-3) also causes the program to crash. Once in the update mode, you cannot escape without writing to the disk. The program tries to do too many things and does none of them well. You would be better off investing in a program which tackles only graphics or creates text files only.

DESK SET

Company: The Programmer's Workshop

Language: BASIC

Hardware Requirements: 40K

Department: Business

Sugg. Retail: \$24.95

Availability: 5

Disk or Tape: Disk

OVERALL RATING **C**
EASE OF USE **C+**
VENDOR SUPPORT **B**

DOCUMENTATION **B+**
VALUE FOR MONEY **C**
VISUAL APPEAL **C**

RELIABILITY **C**
ERROR HANDLING **C**

Desk Set is designed to help you save time in organizing and planning personal calendars and appointment schedules. Two modules make up the program, a Calendar (perpetual and appointment) and a Card File (for names and addresses). The Card File lets you enter, maintain, sort, and edit up to 200 addresses to make up a disk-based mailing list. The file greets you with the options Add, Edit, Print, New, Sort, and Exit. Add gives you a blank form to enter name, address, city, state, zip code, contact name, and phone number. Edit lets you change previous entries. Print calls up addresses to the screen or to the printer based on the search criteria All, Area Code, From-to, Selected Files (by file number), State, and Zip. New completely erases your previous card file and gives you 200 new blank forms to fill out. You must exercise great care with this option, since you could inadvertently destroy a lot of work. The program asks "Are you sure?" before you type the final "Y" to destroy old data. Sort alphabetizes the file according to the order of entry. If you enter first name/last name, the program alphabetizes by first names. One problem occurs when the list of addresses is short. The program sorts the entire file, empty or not, making the process a lengthy one even for a short list.

The Calendar contains room for 400 appointment entries. However, the program must load it and save your card files into memory before you can start using Calendar. You specify the month, year, and day, then receive the option to view appointments for the day, exit, go forward one day, or back up one day. If you view appointments, you face a breakdown of the day into hours. You can change, add, print, or remove (kill) entries. Should you fill all 400 files, you can choose the Kill option and erase all files before a specified date to free them for future use. The New option erases all 400 files. Finally, while in Calendar, you can call up any of your card files to reference an appointment.

You would need to have an extremely busy schedule to find this type of program advantageous. Working with the computer, waiting for each module to load, and waiting again if you need to change the program probably demands more time than if you simply jotted the information down in a regular calendar. It really isn't a function best done by a computer.

LOAN ANALYZER

Company: Creative Software

Language: BASIC

Hardware Requirements: 32K, disk drive or cassette player.
Printer optional.

Department: Business

Sugg. Retail: \$19.95

Availability: 3

Disk or Tape: Disk

OVERALL RATING **B+**
USEFULNESS **B**
VENDOR SUPPORT **C**

DOCUMENTATION **C+**
VISUAL APPEAL **B**
EASE OF USE **B**

RELIABILITY **B**
ERROR HANDLING **B**
VALUE FOR MONEY **A-**

In simpler times (financially speaking), this program could have been even more useful than it is. But even now, if the loan you are considering is a conventional type (that is, of a fixed interest rate, monthly payments, and a specified term), then this program could be valuable to you. It offers some flexibility other than a standard amortization program, power which is a welcome addition to the loan analysis programs normally available. An amortization table will show you:

- (1) Number of payments
- (2) Current interest
- (3) Total interest paid
- (4) Amount paid to principal
- (5) Total amount of your payments
- (6) Your loan balance

The program is flexible in that it will ask for four items:

- (A) Principal, or amount of loan
- (B) The monthly payments
- (C) The term of the loan
- (D) The annual interest rate

You may then input any three of these items, and the program will calculate the missing variable.

Naturally, the usefulness of this program is directly proportional to the number of times in a year you need to calculate different kinds of loans (mortgage, car payments, buying items on credit, etc), or re-figure interest and repayment schedules with variable data. But the program works well, and seems reasonably priced.

HOME LOAN ANALYSIS

Company: APX/Atari Program Exchange

Language: BASIC

Hardware Requirements: 16K cassette, 24K disk

Department: Business

Sugg. Retail: \$24.95

Availability: 9

Disk or Tape: Both

OVERALL RATING **A**
EASE OF USE **B+**
VENDOR SUPPORT **A**

DOCUMENTATION **B+**
VALUE FOR MONEY **A**
VISUAL APPEAL **B+**

RELIABILITY **A**
ERROR HANDLING **A**

Home Loan Analysis, written by Jim Skinner and distributed by APX, is an excellent program that lets you examine and evaluate loan alternatives for a home, auto, or nearly any other installment loan. The program has five main functions: (1) calculate a monthly payment (excluding taxes and insurance); (2) calculate maximum purchase price a buyer can afford; (3) calculate an appreciation rate; (4) calculate a resale value; and (5) produce an amortization schedule. You can view the results on screen or output to your printer. To use the program properly, you should know the interest rate, original purchase price, down payment, balloon payment, and the number of years you will borrow the money. You can change each variable and observe the effect on the loan.

Once you have loaded the program into memory, you see the Main Menu. The author has provided a sample home loan for you to play with, or you can start typing in information from your own loan. The top portion shows the loan data and the lower portion, projected values. You make your selections by moving the arrow up using the Option key, or down using the Select key. Pressing the Start key begins calculations. The excellent manual thoroughly explains each variable. If you want to find the maximum price you can afford for a house, move the arrow to "Monthly Payment" and type in the amount. Moving the arrow to "Purchase Price" and pressing Start yields the maximum amount you can afford to pay based on set figures for the other variables. You can change any variable to see the effect on your loan, an important one being the interest rate. Placing the arrow on "Calculate Amortization Schedule" yields a display of an amortization table for any chosen year, showing Month, Principal Paid, Interest

Paid, and Loan Balance. It also shows total interest and principal paid to date. The lower portion of the Main Menu helps you calculate appreciation of your home. By changing the appreciation rate and moving the arrow to "Resale Value" you can see the effect of inflation on your property.

Home Loan Analysis continues the APX standard of offering worthwhile programs for a fair price. I highly recommend it.

DECISION MAKER

Company: Creative Software

Language: BASIC

Hardware Requirements: 32K Atari 440/800, disk drive; or cassette.

Department: Business

Sugg. Retail: \$19.95 disk/\$14.95 cassette

Availability: 5

Disk or Tape: Both

OVERALL RATING

B-

DOCUMENTATION

C+

RELIABILITY

B

USEFULNESS

C

VISUAL APPEAL

C+

ERROR HANDLING

B-

VENDOR SUPPORT

C

EASE OF USE

B-

VALUE FOR MONEY

B-

Most of us probably arrive at our decisions in much the same manner. Using a mixture of logic and emotion, we mentally weigh the arguments for and against proceeding with a certain course of action, and, usually with intuition predominating, reach a conclusion. Then again, there are those who wait for a full moon, spin three times counter-clockwise at midnight, spit into the wind, then flip a coin...

If you are among those for whom reaching decisions is almost impossible, then perhaps this program could be of some marginal benefit. Essentially, the program computerizes the procedure most of us follow mentally, weighing pros and cons, but here the arguments are assigned numerical values. You may enter up to 10 possible alternatives, and an equivalent number of factors. For example, you might list 10 different cars that you're considering purchasing, along with those factors which might influence your choice (such as price, styling, service guarantees, quality, or loan terms). You then assign a number (1 to 100) indicating to you the relative importance of that factor. (Of course, if you can assign numerical values to your choice-factors, then you're 90% of the way toward making the decision without the aid of machines.) Push the button, and *presto!*, the program produces a "logical" decision.

So is this program truly of use? Having waited for the full moon, spun three times at midnight, spit into the wind, and flipped a coin, I couldn't decide.

STRATEGIC FINANCIAL RATIO ANALYSIS

Company: APX/Atari Program Exchange

Language: BASIC

Hardware Requirements: 32K

Department: Business

Sugg. Retail: \$34.95

Availability: B

Disk or Tape: Disk

OVERALL RATING

B+

DOCUMENTATION

A

RELIABILITY

A

EASE OF USE

A

VALUE FOR MONEY

B-

ERROR HANDLING

A

VENDOR SUPPORT

C

VISUAL APPEAL

A

A highly sophisticated program, *Strategic Financial Ratio Analysis* helps you seriously evaluate your firm's performance and management strategies. You supply a number of values, usually obtained from published financial statements. The program contains a data set editor (which permits compilation and modification of financial data for two different companies or for one company at two different times), a sequential data input (a faster version of the preceding), a strategic ratio computation (which computes fifteen ratios and displays them in a special format), a miscellaneous ratio computation (which computes an additional fifteen common ratios), and a glossary and disk directory (which display definitions of the ratios and assist in the management of data).

The disk comes with two sample data sets to help you learn the program, and a well-documented and well-written manual. The presentation and graphics are good. The program responds quickly and is free of errors. I would advise watching this program in action before buying it just to make sure that it does what you expect.

EDUCATION

Introduction	264
Reading and Language Skills	265
Mathematics & Science	277
Geography & Social Studies	292
Typing Programs	296
Computer Science	298
Miscellaneous Education	303

Education

One of the most important as well as gratifying uses for the Atari computer is in the field of education. It can provide an interactive learning experience for students and easily adjust to their learning speed. It is little short of amazing to watch children from the ages of five years old and up literally sit for hours mesmerized in front of the computer. And, as long as an adult does not tell them that they are "learning", they will continue to use the computer indefinitely.

The object of a good educational piece of software obviously is to teach. It must also challenge the learner while entertaining them at the same time. Programs often have to lead the student while at the same time test and adjust the skill level in order to be successful in conveying knowledge. These are formidable tasks that cause many programs to fail. Fortunately, children are quite used to learning and absorbing information from the medium of television. Programs that take advantage of the Atari graphics and successfully avoid being condescending toward the student will most likely succeed.

Educational programs are currently in their infancy. AP-PILOT is an example of a language that has been specifically developed for educational programming. As new and better programming tools become available for the educator, they, not programmers, will cause a mushrooming in the volume of available software. Educational uses for the computer do not have to be solely directed towards children. The potential for adult education is just as enormous.

Currently, the available educational programs for the Atari computer as reviewed in the following section represent, we hope, just a small beginning of what will be on the market in the near future.

Programmers take note: the education market is huge and is only awaiting the results of your creative and imaginative efforts.

Reading & Language Skills

MY FIRST ALPHABET

Company: Atari Program Exchange

Language: Atari BASIC

Hardware Requirements: 24K, disk drive.

Department: Education

Sugg. Retail: \$24.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING **A -**
EDUCATIONAL VALUE **B**
VENDOR SUPPORT **C**

EASE OF USE **B**
DOCUMENTATION **B**
VISUAL APPEAL **B +**

ERROR HANDLING **A**
RELIABILITY **B**
VALUE FOR MONEY **A -**

My First Alphabet is a very colorful learning program for preschool children. It is, basically, an alphabet book on a floppy disk: "A" is for Apple (not Atari?), "B" is for Balloon, "C" is for Cow, and so forth. The program includes both letters and numbers, each represented by its own picture.

It is a relief that the author of this program also knew how to draw. The pictures are well done, making good use of the Atari's color graphics capabilities. The sound, used to help keep the child interested, is minimal, repeating itself often after a picture is drawn.

Each picture is loaded off the disk. Pictures are drawn in Graphics 7 by loading PLOT, DRAW TO, COLOR, and FILL from the data disk. This allows the disk to store all 36 pictures on one disk, but it does not draw the picture as fast as one would like. A very small child may lose interest after a few pictures. Children over four years old should have no problem with this, and will even be able to operate the program without help after it is loaded in. The child can press any key and get the corresponding picture for that number or letter, along with several other words that begin with that letter. Another option includes automatic random picture display, allowing the child to guess and learn the correct number or letter by pressing the key appropriate to the screen display.

There is one annoying aspect of the program I must mention. When it boots up, it draws a color picture of a clown and plays "The Alphabet Song." Every child I've seen watch this program tries to sing along. However, the program repeats the L-M-N-O-P part, making it impossible to follow from there.

But overall the program is excellent, one that will often be requested by your child.



MY FIRST ALPHABET

RAPID READER

Company: Silicon Valley Systems

Language: Atari BASIC

Hardware Requirements: 24K

Department: Education

Sugg. Retail: \$39.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING **C**
EDUCATIONAL VALUE **C+**
VENDOR SUPPORT **B**

EASE OF USE **B+**
DOCUMENTATION **D**
VISUAL APPEAL **C+**

ERROR HANDLING **A-**
RELIABILITY **B**
VALUE FOR MONEY **C-**

Rapid Reader is a copy protected program intended to "increase your reading speed and comprehension." The menu offers six practice options: Words, Word Pairs, Phrases, Short Sentences, Long Sentences, and Speed Test. Of the two other options listed, one allows the user to change the background and text color (when using large, BASIC mode 2 text), and the other allows the selection of other word lists. All menu options are selected with single key strokes.

There is no documentation other than the advertising on the back of the package. This leaves you somewhat lost on how to use this program effectively, whether in school or on your own. After you initially select a practice option (somewhat at random), screen prompts inform you that the OPTION, SELECT and START keys will respectively take you back to the menu, speed up or slow down the reading rate. You must remember this information later, because it does not reappear on the screen during practice. Also, you are informed of the reading speed range available for your selected option. The lower limit is 50 words per minute, but the upper range, depending on the option, varies from 700 wpm to 2200 wpm. After you type in the desired speed and press the RETURN key, the practice starts. Reading speed can be changed anytime by using the SELECT or START keys. During a speed change, numbers indicating the current reading speed flash in the lower left of the screen.

The options Words, Word Pairs, and Phrases all use large-text capital letters. Depending on which option you choose, single or sets of words flash on the screen at your specified rate with the first appearing at the top of the screen. Each subsequent word or word set appears on the next lower line. When the bottom of the screen is reached the process repeats itself by again starting at the top of the screen. This process of displaying words is also used in both the Short and Long Sentence options. These two options allow the selection of either large or small text, but letters are still all in caps. The smaller text is easier to read. Short sentences are usually composed of two to four words, while the long sentences are eight to twelve words long.

The Speed Test option consists of two sentences flashed one after another at a reading rate of your choice. One of these sentences then appears on the screen with a word missing. You are asked to type the missing word. Sound effects and text are used to signal correct and incorrect responses. Although the sentences are grammatically correct, they are computer constructed randomly from word banks in each word list and are generally humorous and frequently nonsensical.

Rapid Reader comes with five word lists. Two of these are unmodifiable: one contains English words and the other, Spanish. Three other word lists provided on the disk are modifiable. The program provides rapid drill in the mechanics of speed reading and can be tailored to the individual user's needs both in specialized vocabulary and reading rate. However, it suffers from lack of documentation and integration into a larger plan for increasing reading speed.

COMPU-READ

Company: Peachtree Software

Language: BASIC

Hardware Requirements: 48K

Department: Education

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Both

OVERALL RATING **C-**
EDUCATIONAL VALUE **B**
VENDOR SUPPORT **B**

EASE OF USE **C**
DOCUMENTATION **C-**
VISUAL APPEAL **D**

ERROR HANDLING **C+**
RELIABILITY **C**
VALUE FOR MONEY **C-**

Compu-Read is designed to improve reading speed and recall skills. Four learning modules are included in the package: Letter Recognition, which asks the user to recall three letters flashed on the screen at the same time; Rapid Words, in which the user is asked to recall a word flashed on the screen; Synonyms and Antonyms, which links word recognition and vocabulary skills; and Sentences, which asks the user a question about a short sentence flashed on the screen.

After each learning module has been completed, a progress chart appears on the screen. The chart lists the number of trials, the number of correct and incorrect answers, and the percentage of correct answers. The chart also includes the display time in seconds for both the first and final trials, as well as the rate in words per second. A graph consisting of a series of vertical lines demonstrates the changes occurring in the user's performance from one trial to the next.

The program contains a system generator which allows the user to change the parameters of the program to suit the student's needs. This feature is especially useful to the teacher who prefers individualized instruction. The learning sequence can be changed by deleting individual modules. Learning parameters, which include the number of trials, initial speed, speed increment, and type font size can all be adjusted. The user can also add or delete files in all but the Letters unit.

Although *Compu-Read* is designed for both home and school use, only a qualified teacher or reading specialist could use it effectively. Once the program is booted up, no instructions appear on the screen, leaving the user at the mercy of trial and error. The teacher would therefore have to explain to the student exactly what to do in each learning module.

The printed documentation is of little value in showing how to use the program. The first ten pages are devoted to explaining the instructional model, but do not explain how to operate the program once it appears on the screen. The remaining fourteen pages give clear and detailed instructions on the use of the system generator. These instructions, however, offer little help to the average user of the program.

Students who are already anxious about the computer will find an annoying flaw in the program. If the wrong key is accidentally mistyped, there is no way of correcting the answer; it will be registered in the computer and counted as a wrong answer, even if the user meant to type the correct answer. Moreover, anyone looking for a program containing creative sound effects and extensive color graphics should stay away from this one. *Compu-Read* makes no use of them. Such features, though not an essential part of this type of educational program, are nonetheless desirable.

Although the authors maintain that *Compu-Read* is geared for ages eight to adult, the program is hardly suitable for an adult audience. The material covered is not extensive enough to improve reading speed substantially. Its most effective use would be to supplement individual instruction in a reading classroom.

STORY MACHINE

Company: Spinnaker

Language: Forth

Hardware Requirements: 48K

Department: Education

Sugg. Retail: \$34.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING **B**
EDUCATIONAL VALUE **B+**
VENDOR SUPPORT **B+**

EASE OF USE **C-**
DOCUMENTATION **B**
VISUAL APPEAL **A**

ERROR HANDLING **B**
RELIABILITY **B**
VALUE FOR MONEY **B**

"The best laid schemes o' mice an' men gang aft a'gley...." In *Story Machine*, from Spinnaker Software, we have a good idea fallen short of its potential. Just imagine the possibility of seeing stories you invent come to life on the video screen. Whatever you type in can be acted out, using both sound and graphics to add to your enjoyment. Sounds good, right? *Story Machine* has the potential to be great, but falters in the execution. Its graphics are superb, and its intended use exciting; but it is difficult to use, and the vocabulary available for creating stories too limited.

Aimed at children in the primary grades, *Story Machine* can animate stories on screen, within limits. When you first load your program you'll be greeted by a cute little character who climbs up a ladder and waits until the title appears, after which a series of options will be listed at the bottom of the screen: (1) Story; (2) Dictionary; (3) Disk; and (4), Choices. These modes allow you to enter the story, consult the dictionary, save the story to disk, or get help. You will be asked if you want sound, a black or a white background, and whether or not you want the available Help options. To write a story you must follow certain rules: you must start each sentence with a definite article; always use present tense verbs; ensure that periods or prepositional phrases follow a verb; make sure that pronouns apply only to the last noun used as the subject of a sentence; always end sentences with periods; and have a maximum of four actors on the screen at any one time. There are other constraints as well. Vocabulary is limited to the contents of the program dictionary. Verbs cannot take direct objects. Sentences that are in an inverted order cannot be animated. And there must be spatial relationships between actors (i.e., objects on a screen). For example, the actors must be next to each other before they may interact. Fortunately, correcting misspellings or erasing invalid words is simple. Once the story is created, pressing the Escape key allows you to re-run the story.

The video screen, or "story window," is divided into two parts. The top half is where the story is acted out, and the bottom is where the story is written. Following the guidelines that the program establishes makes for slow going when writing the story. Many times you'll want to do one thing, only to find that it isn't possible. *Story Machine's* dictionary contains only 45 words (67 if you count the plurals), which is pretty limiting. Whenever you use a word not found in the dictionary a slash mark will appear and the word will be erased from your story. This also happens when a word or a sentence is not grammatically correct.

You have the option of saving your story. When you finish it (about 40 words on average, or 256 letters), a warning appears at the top of the screen telling you how many letters are left. Press option 3 to save the story. You can save 15 different stories on each new story disk.

Story Machine's documentation is thorough. It claims that the program teaches children sight vocabulary, the recognition of such grammatical considerations as syntax, keyboard familiarity, and promotes a positive attitude toward writing. As with most programs of this type, there is room for improvement. *Story Machine* is a fine program, as far as it goes, that has the potential to be superb. A larger dictionary is essential, as it would provide greater leeway in the kind and variety of sentences the program would accept. Still, it can be an advantageous tool for the primary grade teacher or parent in helping the young child to express his thoughts on paper.

SAMMY THE SEA SERPENT

Company: Program Design, Inc.

Language: Atari BASIC

Hardware Requirements: 16K, disk drive, and joystick

Department: Education

Sugg. Retail: \$16.95 cassette / \$23.95 disk

Availability: 5

Disk or Tape: Both

OVERALL RATING **A**
EDUCATIONAL VALUE **B**
VENDOR SUPPORT **B**

EASE OF USE **A**
DOCUMENTATION **A**
VISUAL APPEAL **B**

ERROR HANDLING **A**
RELIABILITY **B**
VALUE FOR MONEY **B-**

This program is a computerized storybook for young children. Simple but appealing graphics illustrate a story about Sammy, a sea serpent who is thrown from the sea by a storm. He is trying to return to the sea, and along the way the child must "help" him by using the joystick to guide him through tunnels, along paths, and so on. The story plays over the cassette, while the computer handles the graphics and interactive sections. The storyline and accompanying background music are pleasant, and the program is a very nice introduction to computers for preschool age children. The level of eye-hand coordination required to handle the joystick during interactive sequences is appropriate.

In addition, the child may play two other simple games with the Sammy character: catching flies and guiding Sammy through random mazes. The "Flies" game is appealing, with just the right amount of challenge. The mazes, however, are less successful, partly because they are generated on the spot, which takes much too long, and often produces uninteresting mazes.

Yet from storyline, to challenge and age applicability, *Sammy the Sea Serpent* is a charming and worthwhile program.

HODGE PODGE

Company: Artworx

Language: BASIC

Hardware Requirements: 32K

Department: Education

Sugg. Retail: \$21.95 for cassette & disk

Availability: 4

Disk or Tape: Both

OVERALL RATING **B+**
EDUCATIONAL VALUE **B**
VENDOR SUPPORT **C**

DOCUMENTATION **C**
VISUAL APPEAL **B**
VALUE FOR MONEY **B**

RELIABILITY **B+**
ERROR HANDLING **B**

Hodge Podge is an educational program for pre-school children. It does an admirable job of teaching the child to associate keyboard letters with words that begin with those letters. Yet it is not necessarily an alphabet learning program since the words used are often abstract. For example, while "A" gives a picture of an apple, "Q" demonstrates the difference between quick and slow using a worm that first crawls fast then slowly. *Hodge Podge* holds a child's interest much longer than *My Alphabet*. The music is more varied, and there are animated sequences. The pictures, however, are less colorful, and have nowhere near the artistic quality of its competition. The music has some problems with meter, but a child should have no problem trying to sing along with the "Alphabet Song."

In sum, the program is a good teaching tool for children in kindergarten, or younger.

RHYMES AND RIDDLES

Company: Spinnaker Software
Language: Atari BASIC
Hardware Requirements: 48K

Department: Education
Sugg. Retail: \$18.95 cassette
Availability: 7
Disk or Tape: Disk

OVERALL RATING **B+**
EDUCATIONAL VALUE **B**
VENDOR SUPPORT **A**

EASE OF USE **A**
DOCUMENTATION **A**
VISUAL APPEAL **B**

ERROR HANDLING **B**
RELIABILITY **A**
VALUE FOR MONEY **B+**

Rhymes and Riddles is an educational program designed for children five to nine years of age. It consists of three programs which challenge the student to identify nursery rhymes, riddles, and famous sayings.

All three games begin by asking your name. When you type it in, the games take on a more personal aspect. The three programs operate in a way that is similar to the spelling game "Hangman." In each, you are asked to identify a nursery rhyme, a riddle, or a famous saying by choosing a letter to fill in the blank. When your letter is correct it appears in one or more of the blanks. If the letter you choose is wrong, it appears at the top of the screen in the misses or mistakes box. You are only allowed six misses and then you are out.

The program uses both color and sound to good advantage in keeping the student's attention. In the "Nursery Rhymes" game you are asked to guess the letters one line at a time, with a maximum of four lines presented. If you guess a line correctly, the program rewards you with that nursery rhyme set to music. After all four lines are done correctly, you are rewarded with the whole song as well as a picture to illustrate the nursery rhyme.

"Riddles and Famous Sayings" are very similar programs in design. The object again is to guess letters that go into the blanks. When you are successful you are rewarded not only with a smiling face and a positive remark, you also get a nice graphic and/or sound display. Some of the things displayed include rockets flying across the screen or line patterns that seem to be dancing. Sound rewards include first lines to songs such as "Happy Birthday," "Pop Goes the Weasel," and "Jingle Bells."

Although at first *Rhymes and Riddles* seems better geared for younger learners, this is a good program to have in your education library and should appeal to most computer users. Though the program was aimed at the five to nine years olds, "Nursery Rhymes" will probably be used the most by the younger set. But don't let that older brother or sister get hold of "Riddles and Famous Sayings" or the computer may never be turned off again. I played "Famous Sayings" for over an hour for the pure pleasure of it, and thoroughly enjoyed myself.

All in all this is a fine program, cleverly designed and packaged, and should provide hours of learning entertainment for the whole family.

CONVERSATIONAL SPANISH/ FRENCH/GERMAN/ITALIAN

Company: Atari
Language: Atari BASIC
Hardware Requirements: 16K; cassette.

Department: Education
Sugg. Retail: \$59.95 each
Availability: 6
Disk or Tape: Tape

OVERALL RATING **C**
EDUCATIONAL VALUE **C**
VENDOR SUPPORT **B+**

EASE OF USE **A -**
DOCUMENTATION **C**
VISUAL APPEAL **B -**

ERROR HANDLING **C**
RELIABILITY **B -**
VALUE FOR MONEY **B**

Atari has put out a series of four separate but identical language courses designed to introduce beginners to Spanish, French, Italian, or German. Each package looks, costs, and operates the same; in fact, the phrases, the order in which they appear, and names of the lessons are the same. It is therefore not inappropriate to review the group of packages by concentrating on one, *Conversational Spanish*. The following remarks are generally applicable to each language course.

Conversational Spanish is a package of five cassettes containing an audio/computer learning program and a coursebook of twenty-seven pages. The computer serves as tutor and a guide which gives practice in understanding, speaking, listening, and reading. Each cassette contains two units, one on each side, and each unit is divided into two or three learning phases, or sections. The book is the reference manual for use after each learning phase on the computer. Each unit in the book contains: study (language notes); practice (writing exercises); and activities (reading and writing assignments). There is also a grammar summary, a vocabulary list, and the answers to the exercises.

Various techniques involving computer technology are used. Some are quite simple, such as listening, or listening and repeating. Most sessions require making choices and decisions. The computer tells you that you are correct by flashing the Spanish equivalent of "Very Good" along with a musical chord, or wrong by flashing the word "No" and sounding one low note. Only once does a correct answer get a different response — a colored flash. The only other use of the Atari's sound capabilities is a beep to passages as part of an exercise, and a glissando while erasing the screen at one point.

The program is not at all visually exciting, although it alternates print sizes and colors and has some line and block "drawings." It employs conventional pattern practice formats, but does have a crossword puzzle and a slot machine game (although the instructions for both are lengthy and easily confused, which invalidates the end-of-unit assessment of performance score).

The course presents Spanish as spoken in Latin America, particularly in Mexico. It is modern, everyday language, appropriate for dealing with situations when travelling in Spanish-speaking countries or meeting Spanish speakers. The verb forms presented are limited to the yo, usted, el, ella, and ellos, omitting the familiar tu, the nosotros and the ustedes persons. The Spanish which appears on the screen is not completely accurate. There are several accents missing, the tilde over the "n" is straight rather than curved, and there are no upside down question marks at the beginning of questions. For some strange reason there are no periods at the end of sentences, either. Words, sentences, and conversations are authentically pronounced by both a man and a woman. The main fault in the course is the lack of spoken examples. There should be twice to three times as many repetitions on the audio portion in order to reinforce learning, and to avoid the boredom caused by the extremely slow pace of the lessons.

Each learning phase is broken up into different activities, such as LOOK AND LISTEN, THINK AND CHOOSE, etc. Most of the exercises include synchronized audio, to train you to understand and speak; but some require you to work silently on the screen. The program itself controls the sound track, to repeat them, in which case there is no sound because the tape does not rewind automatically, and it is quite complicated to keep track accurately of the numbers on the recorder counter. If you want to run through a unit again, you must rewind the cassette and reload it.

It is recommended that you study little and often, which is sound advice in learning a foreign language. Supposedly you can stop the program at any point and continue when you are ready, but if you turn the computer off at the end of a learning phase (despite your having made note of the counter number or having left the tape where it was), there are no instructions about how to load the next section, namely to type CLOAD. If you get an error message while loading a section by the usual instruction to press RETURN, nowhere does it say how to use CLOAD after rewinding the loading point of that section. Since one side of a cassette takes from forty to fifty minutes to complete, it is a real disadvantage to have to start at the beginning each time. It is frustrating to an adult, let alone to a youngster of fourteen, which is the lowest age for whom the program is recommended.

Many of the flaws of the program are inherent in the use of the tape recorder. Tapes are necessary, however, to provide the audio portion essential in a foreign language program. Several sections were troublesome, one completely refusing to load no matter what I did to it. It is most annoying to have to go back to the retailer to get a replacement, which you do not know will function properly until you try it — another long process.

The reliability of the program is also diminished somewhat by the fact that the BREAK key was not disabled. If a student accidentally hits it, there are no instructions to type CONT or to type RUN after hitting SYSTEM RESET.

The quality of the program is uneven, ranging from overly long pauses provided to read the screen, and confusing instructions for several exercises, to an excellent presentation in lesson eight. Despite the unevenness of the program, it is educationally sound; and, if you have the patience, it can provide the basis for further learning of the language. I found the coursebook to be outstanding, full of fascinating detail, which imparts the cultural flavor so necessary to language learning.

WORDMAKER

Company: Atari Program Exchange

Language: Atari Basic

Hardware Requirements: 32K cassette; 40K disk; joysticks recommended.

Department: Education

Sugg. Retail: \$22.95

Availability: 8

Disk or Tape: Both

OVERALL RATING **A**
EDUCATIONAL VALUE **B**
VENDOR SUPPORT **C**

EASE OF USE **A**
DOCUMENTATION **A**
VISUAL APPEAL **B**

ERROR HANDLING **A**
RELIABILITY **A**
VALUE FOR MONEY **B+**

Wordmaker is a game in which two players compete against each other, or one player races the clock in order to put together as many short words as possible within the time frame. Words are of 3-4 letters, and the time limit runs from 2-5 minutes. Players use joysticks to select letters. If a player's word is legal, it is displayed in his space; if it is illegal, a message appears and points are deducted from his total score. If the word duplicates one already in either player's box, the program rejects it, but points are not deducted.

When the game ends and the winner is declared, the words used may be printed out on a printer. The game moves fast, appears to be clean and bug-free, and the vocabulary of short words is extensive (although it thought "hake" was fishy, and rejected it). This one should be a winner for rainy-day recess.

PREFIXES

Company: APX/Atari Program Exchange

Language: BASIC

Hardware Requirements: 16K

Department: Education

Sugg. Retail: \$29.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING	A	EASE OF USE	B+	ERROR HANDLING	B+
EDUCATIONAL VALUE	A-	DOCUMENTATION	A	RELIABILITY	B
VENDOR SUPPORT	C	VISUAL APPEAL	A	VALUE FOR MONEY	A

It is always a pleasure to review a thorough and concise educational program that is excellent both as a skill builder and as a motivational aid to learning for children in grades 2 through 6. *Prefixes* is such a program. It provides instruction in a major language arts skill, word structure, that plays a vital role in reading ability. Two types of lessons are presented: teaching and review. There are seven lessons, of which two are review, explaining five of the most commonly used prefixes. Each teaching lesson instructs the student in the use of the prefixes "dis," "re," "un," "pre," and "in," and consists of the following four parts: identification of the prefix, the meaning of the prefix, the application of comprehension skills for the lesson, and the summary score.

The student is presented with the definition of the prefix and examples to clarify meaning, graphics to reinforce the meaning, and drill exercises. During the drill session the student is required to underline (or type) the prefix or root word, or type the new word formed by the prefix. Finally, the student uses the new word created by the addition of the prefix in a sentence. Before proceeding to the next drill, activity sheets included in the documentation should be duplicated by the teacher and used for reinforcing the lessons.

The review sections are very enjoyable due to variations in the format of the program. For example, "Dragon Fire" is a game in which students fill in the appropriate blank, used in creating a story. Each time the correct answer is supplied, a part of the dragon appears on the screen. Eleven out of fifteen problems must be answered correctly before the entire dragon will appear. The lesson entitled "Chip 6502" reviews the meaning of all five prefixes by using a story about a robot. The robot is constructed piece by piece if the blanks are filled in correctly, in the same manner as "Dragon Fire." Again, eleven out of fifteen problems must be answered correctly; once this is achieved, the robot will play a tune in reward.

The documentation accompanying *Prefixes* is particularly good, offering the teacher suggestions, activity sheets, an explanation of the use of the Atari computer, and an explanation of how the authors determined which prefixes to include in their program (surveys were done of the textbooks of seven major publishing companies). *Prefixes* is a most enjoyable and creative instructional program, and definitely worth the price.

FINGERSPELLING

Company: APX/Atari Program Exchange

Language: BASIC

Hardware Requirements: 16K tape, 24K disk

Department: Education

Sugg. Retail: \$24.95

Availability: 8

Disk or Tape: Both

OVERALL RATING	B	EASE OF USE	A-	ERROR HANDLING	N/A
EDUCATIONAL VALUE	B-	DOCUMENTATION	B	RELIABILITY	A
VENDOR SUPPORT	C	VISUAL APPEAL	B	VALUE FOR MONEY	B

Fingerspelling teaches the sign language deaf people use to spell out words, usually difficult words that have no signed equivalent (signing employs the hands, arms, and body to communicate words, phrases, and ideas; it is the common form of communication among deaf people). *Fingerspelling* is rarely used because of its slowness, but skin divers and others use it. If you want to learn to communicate with deaf people, you should learn signing instead. Given the limited use of *fingerspelling*, this program teaches it well. It is easy to use and visually appealing.

The program works in two modes: Show Me and Test Me. In the first, you type in a letter or word and the screen displays a well-drawn hand forming the correct letter. You can adjust the speed over a range of nine levels, each represented by an animal (from snail to cheetah). The steps are well graduated, also, the first few levels speeding up only as you gain proficiency. In the second mode, the computer tests you on letters or words. You can stop the test at any time to check the results, but this automatically resets the tally so that you cannot carry over your score. Another minor annoyance is the horrible rendition of the alphabet song that starts as soon as you boot the program. A hand forms the letters as the song proceeds. You cannot start working until the song has ended. A child might not mind this as much as I did, but I found it a distinct flaw in an otherwise well-done package.

LANGUAGE LAB DRILL KIT II

Company: Bluestone Software
Language: BASIC
Hardware Requirements: 16K

Department: Education
Sugg. Retail: \$19.95
Availability: 2
Disk or Tape: Both

OVERALL RATING **D+**
EDUCATIONAL VALUE **C-**
VENDOR SUPPORT **C-**

EASE OF USE **B**
DOCUMENTATION **A**
VISUAL APPEAL **D**

ERROR HANDLING **D**
RELIABILITY **D**
VALUE FOR MONEY **D**

One word describes Bluestone Software's *Language Lab Drill Kit II*—mediocre. You can use the program (geared for grades four through eight) as a follow-up learning station, for group instruction, for an older student to teach a younger student, or at home. It proves practical only as a visual aid in the classroom. If you want to use it this way, you should adapt it to fit your regular grammar instruction.

The program drills students on sentence types, punctuation, subjects and predicates, sentence fragments, verb tenses, topic sentences, outlines, finding information, and card catalogs. Unfortunately, definitions of grammar terms are not always clear. Each drill contains twenty exercises. Following each response, sounds indicate whether the student has answered the question correctly. The answer appears again so that the student can study it. Some of the questions have more than one correct answer, but only one is counted correct. Others ask for a correction when none is necessary.

A scoreboard above each exercise lists the student's name, the number of problems, the number of problems answered correctly, and the percentage of correct answers. After the student has completed the exercise, the computer suggests more practice or congratulates the student on a job well done. At this point, the computer prompts the student to type "R" to repeat that section, "M" for menu, and "E" for end. On random occasions, typing "R" brought an error message. If the student has no experience with BASIC programming, they will have to ask you for help. Graphics are nonexistent. Background colors vary somewhat. The documentation is well written, concise, and easy to follow. I found it the only good part of the program.

MICKEY IN THE GREAT OUTDOORS

Company: Atari, Inc.
Language: Machine
Hardware Requirements: 16K

Department: Education
Sugg. Retail: \$39.95
Availability: 8
Disk or Tape: Tape

OVERALL RATING **B+**
EDUCATIONAL VALUE **B-**
VENDOR SUPPORT **C-**

EASE OF USE **B-**
DOCUMENTATION **C+**
VISUAL APPEAL **A**

ERROR HANDLING **B-**
RELIABILITY **B**
VALUE FOR MONEY **A-**

Walt Disney Productions designed *Mickey in the Great Outdoors* exclusively for Atari for the seven to ten year old age group. You guide Mickey through two adventures, each containing two educational games. On the first side of the cassette, Mickey goes hiking. You learn sentence structure. You aim Mickey's arrow to shoot at the correct word to complete a five-word sentence bridge, so that Mickey can cross the stream. I liked the realistic cartoon graphics, but the limited joystick control of Mickey's movements disappointed me. He does speed up to cope with a speedy turtle and speedier clouds containing the missing words. You play for sixty-four sentences, or until the computer completes three. Your adventure continues in Mickey's magic garden, where Mickey needs your help to unscramble a four-letter word. You must listen carefully to the simple tones for correct placement, incorrect placement, and letter pick-up. Also, you use each letter only once while unscrambling the word. You win points according to the time it takes to spell the word correctly. The game has little action, and ends after ten words or after the computer unscrambles three words.

On the second side of the cassette, you help Mickey explore the world of numbers. First you help him catch butterflies to correctly complete an equation involving addition, subtraction, multiplication, and division, and the relationships among them. Next, you help Mickey complete sequences of numbers. The arcade response format makes this game exciting. As a frog jumps over lily pads representing the possible answers, Mickey paddles his canoe overhead. When the frog lands on the right answer, Mickey must lower his paddle to cover the poor frog. As you improve, the lily pads begin to float back and forth.

I would like to see a warranty with this package, but mine worked with no problem. Otherwise, the only element missing is adaptability. You can't add sentences or words, or modify the program in any way to offer more challenge as you improve.

WORDGO

Company: APX/Atari Program Exchange

Language: Atari BASIC

Hardware Requirements: 40K

Department: Education

Sugg. Retail: \$24.95

Availability: B

Disk or Tape: Disk

OVERALL RATING **B**
EDUCATIONAL VALUE **B**
VENDOR SUPPORT **B**

EASE OF USE **B+**
DOCUMENTATION **B**
VISUAL APPEAL **A-**

ERROR HANDLING **A**
RELIABILITY **A**
VALUE FOR MONEY **A-**

In *WordGo* you try to mark four squares in a row—horizontally, vertically, or diagonally. This program demands strategy and quick thinking, helping you improve word attack skills, spelling, and vocabulary. The playing field (a four-by-four grid on a Graphics Mode 7 screen) employs four colors with a fifth marking the cursor. Each box contains a word ending (such as "ool" or "ief") in letters large enough to be seen at a distance from the screen.

One or two people can play this game, but they compete against the high score, not each other. If two people play, you each have your own playing screen. A blend (two or three consonants together, such as "scr" or "bl") appears at the top of the screen and a thirty-second timer begins counting down. You have two options. Either find an appropriate ending on your screen ("scrap" or "blank," for example), or press the Select key to indicate that no proper combination exists. To choose a combination, you move the cursor to the proper square with the joystick and press the trigger. The word displays at the top of the screen, and your score increases by an amount depending upon the time remaining. Play then passes to your opponent. You are not penalized for incorrect choices except that the timer continues, unless you press the Select key when a combination is possible. In that case, your score drops substantially. Strategy is important, because if you complete two or three rows at the same time, the score (normally doubled) quadruples for two complete rows, and is doubled again for three rows. If you manage to end in a strategic position, you can obviously increase your score tremendously.

At any time you can check the meaning of a word by holding down the trigger as you indicate your choice. The computer accesses a dictionary file by using the Point command. This helps you learn unfamiliar words, plus new definitions of familiar words. Although some of the words would not fall within the normal vocabulary of a younger player, the game targets ages eight through adult. I watched my seven year old daughter, my ten year old son, and several adults play with notable success. The only criticism was of the difficulty in placing the cursor quickly using the joystick. My children especially liked making words and competing against the high score rather than each other. My son said that he liked the sound effects, but I thought this the weakest part of the program.

You need to watch out for a few things. The Break-key has not been disabled, and pressing it causes the program to crash. Pressing Option starts the game over, so you must be careful not to press this key when reaching for the Select key. Pressing System Reset reloads the program from the disk. Luckily, the documentation is clear and concise. It describes the game, gives helpful hints, and briefly discusses the game's educational objectives. The game better suits recreation, but it does teach along the way. *WordGo* is one of the best word games I have seen, and I heartily recommend it.

SPELLING BEE GAMES

Company: Peachtree Software

Language: Atari BASIC

Hardware Requirements: 48K

Department: Education

Sugg. Retail: \$39.95

Availability: 9

Disk or Tape: Both

OVERALL RATING **B**
EDUCATIONAL VALUE **B+**
VENDOR SUPPORT **B+**

EASE OF USE **C**
DOCUMENTATION **A**
VISUAL APPEAL **A**

ERROR HANDLING **A**
RELIABILITY **A**
VALUE FOR MONEY **A-**

Spelling Bee Games includes four games for elementary school students aged five to ten. "Squadron," a word recognition game, also develops eye-hand coordination. This game is limited to two players who "fly" their airplanes to the appropriate words identifying pictures displayed at the bottom of the screen. As many as four players can play "Skyhook," taking turns spelling words associated with displayed pictures by using a helicopter equipped with a skyhook to pick up letters and place them in the correct order. "Puzzle" resembles "Concentration." Six pictures are briefly shown and then covered. A player's name will appear along with the name of one of the six pictures. That player must identify the correct panel number covering the picture. The fourth game is "Convoy," in which one to

four players can compete. A picture appears in the upper part of the screen. The players take turns typing the letters of the word naming the picture while trucks of players who make correct responses advance across the screen.

Spelling Bee Games consists of two disks. The games occupy the first disk and the high-resolution picture files used in the games occupy the second disk. The documentation explains a reconfiguration option that permits people with two disk drives to reconfigure the program in order to take advantage of two drives. You can choose among twenty-two units or word lists for the games. For example, a list of simple two- and three-letter words suits younger students. For more advanced students, words with hard c's and silent e's offer more challenge. Units can be used singly or in combination to fit the capabilities of students playing the games, or to stress certain types of words.

This is not a spelling drill and practice program. Also, no provision exists for a teacher to add a list of words. However, the games make recognition and spelling enjoyable.

MY SPELLING EASEL

Company: Atari, Inc.

Language: Atari BASIC

Hardware Requirements: 24K

Department: Education

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING **B-**
EDUCATIONAL VALUE **C+**
VENDOR SUPPORT **B+**

EASE OF USE **B**
DOCUMENTATION **B-**
VISUAL APPEAL **B**

ERROR HANDLING **B+**
RELIABILITY **B**
VALUE FOR MONEY **B-**

My Spelling Easel is described as "a painting of the words." Geared toward three to eight year old children, the student essentially creates landscapes by typing letters and spelling words. For example, such words as "swing," "flag," or "cloud" may appear at the bottom of an empty screen. Depending on the skill level, the child types one or more letters. Upon duplicating the randomly generated word below the original, a picture representing the word appears. A song plays after ten objects have appeared; and the child has composed a landscape scene.

Additional creative features offer the child variety. For instance, he can change the scene during the course of creating it. If he does not want the word "flag," he presses the Select key and a new word appears. By typing 1, 2, or 3, he can change the colors in the scene. If he leaves his computer, *My Spelling Easel* will automatically generate landscapes until he resumes play. Finally, children can change skill levels while working on a landscape without having to start the lesson from the beginning.

Using keyboard inputs or a joystick controller, the student chooses from four levels: "Easy Scene," "Easy Scene II," "Type a Scene," and "Type a Scene II." At the first level, "Easy Scene," the child can touch any key on the keyboard to place an object on the screen. The word is duplicated letter by letter beneath the original spelling. "Easy Scene II" requires the child to type one letter to fill in the spelling of a word on the screen; but this time the screen will not change until he presses the correct letter. In "Type a Scene," the child must type every letter in the word (although not necessarily in the correct order). Finally, "Type a Scene II" requires that each letter of a word be typed in the correct order.

This unique program allows the user to create thousands of scene variations. In turn, these pictures and scenes reinforce basic word recognition skills. While word recognition vocabulary drill is common in primary grades, a drill on short and long vowels may have been more useful and just as easy to implement. Still, with its colorful graphics and informative documentation, *My Spelling Easel* is an excellent motivator for the child, and the parent of a pre-schooler or primary grade teacher will find it a real aid in helping the child learn how to spell.

ANALOGIES

Company: Program Design, Inc.

Language: Atari BASIC

Hardware Requirements: 8K, disk drive

Department: Education

Sugg. Retail: \$18.95 cassette / \$23.95 disk

Availability: 5

Disk or Tape: Both

OVERALL RATING **B-**
EDUCATIONAL VALUE **B**
VENDOR SUPPORT **B**

EASE OF USE **B+**
DOCUMENTATION **A**
VISUAL APPEAL **B**

ERROR HANDLING **B**
RELIABILITY **C**
VALUE FOR MONEY **C+**

This program attempts to teach high school students problem solving skills needed on examinations such as the SAT and the College Board Entrance Exam. It is a cram course, and a rather good one. The program incorporates six lessons and a quiz, and is accompanied by an excellent pamphlet. This program is part of PDI's "IQ Builder"

series, and the pamphlet begins by defining the term "IQ" and its imperfect relationship to achievement testing; it then goes on to discuss analogy strategies, outlining 27 categories of analogy. The first two lessons ask the student to fit word pairs into the proper category; the remaining four lessons are standard analogies. If the student misses a question, the program tells him which of the 27 categories applies, and gives him a second chance; if he fails again, he is given the correct answer.

The analogies in this program suffer from the same flaws as those on the tests for which it seeks to prepare the student: some are arguable, and a few are just plain wrong. (Battles may be an effect of war, as the program asserts, but rain is really not an effect of thunder.) Both program and pamphlet are marred by inadequate proofreading ("condition and it's effects," "desease," "the first answer that looks like it might be correct," etc). But despite these shortcomings, *Analogies* should prove quite effective in sharpening students' test-taking skills.

PRIMARY PHONICS LAB 1

Company: Bluestone Software

Language: BASIC

Hardware Requirements: 32K

Department: Education

Sugg. Retail: \$19.95

Availability: 1

Disk or Tape: Both

OVERALL RATING **B**
EDUCATIONAL VALUE **B**
VENDOR SUPPORT **B+**

EASE OF USE
DOCUMENTATION
VISUAL APPEAL

B-
A-
C-

ERROR HANDLING **B+**
RELIABILITY **B**
VALUE FOR MONEY **C+**

An unpretentious program, *Primary Phonics Lab 1* drills preschool and primary students on the sounds of the letters of the alphabet without the benefit of a voice synthesizer or taped recording of the sounds. It accomplishes this ambitious task admirably, nonetheless, by showing a picture along with a word missing a letter. The child fills in the blank. I noticed one problem with some of the pictures—often the students did not know the word (like a firecracker's fuse, or a test tube). The pictures are generally of good quality, and children receive sound and color reinforcement but no scores.

Several children asked for their scores after using the program. They enjoyed *Primary Phonics Lab 1*, but required close, almost constant supervision. But you cannot explain the program and come back later to check the child's progress. The first program covers initial consonants, ending consonants, short vowels, and long vowels. Letters appeared in alphabetic order for the most part. Given the caveats of constant supervision and lack of randomness (which keeps a child from enjoying it after a time), I found the program helpful in teaching letter sounds to young children.

ASTRO-QUOTES

Company: Program Design, Inc.

Language: Atari BASIC

Hardware Requirements: 16K, disk drive

Department: Education

Sugg. Retail: \$16.95 cassette / \$23.95 disk

Availability: 5

Disk or Tape: Both

OVERALL RATING **C**
EDUCATIONAL VALUE **B**
VENDOR SUPPORT **B**

EASE OF USE
DOCUMENTATION
VISUAL APPEAL

B
B
C

ERROR HANDLING **D**
RELIABILITY **B**
VALUE FOR MONEY **B-**

Astro-Quotes offers an interesting concept: a vocabulary-building game that also familiarizes the user with some well-known quotations. Unfortunately, the program execution is less than ideal.

The disk includes three separate programs, each containing 170 words and 30 to 40 quotations. In each, the student is presented with the definitions of four words; their length is indicated by blanks, and with a set of blanks representing the quotation. If he guesses any word correctly, the word is printed out, and any of its letters that occur in any other words of the quotation are printed in the appropriate blanks, making subsequent guesses easier (much as in the game, "Hangman"). Words and quotations are randomly paired with each game play, so even after all four words are guessed correctly, some blanks may remain in the quotation. The student may guess the quote at any time, but can only achieve a perfect score by getting all four words correct. Once the quote is guessed (or the student gives up), all answers are printed out, and the student may choose another set or quit.

Most of the words should be within the range of a literate high school student. The set of words in each game is so small that repetitions begin to occur after a few plays. Perhaps the programmers would have had space for more had

they omitted the distracting flashes and sounds that accompany the program. Setup is annoyingly slow, no doubt because the program is in BASIC.

Reliability is a major weakness in this package; it failed to run any of the games on two 16K computers on which it was tested. On a third (48K), it automatically selected the first game, regardless of the user's wishes.

WORD RACE

Company: Don't Ask Software

Language: BASIC

Hardware Requirements: 32K, disk drive.

Department: Education

Sugg. Retail: \$19.95

Availability: 5

Disk or Tape: Disk*

OVERALL RATING **B**
EDUCATIONAL VALUE **C+**
VENDOR SUPPORT **B**

EASE OF USE **B**
DOCUMENTATION **C+**
VISUAL APPEAL **B**

ERROR HANDLING **A**
RELIABILITY **A**
VALUE FOR MONEY **B+**

Word Race is a competitive dictionary word game for 1 to 4 players. Words are presented to each player and he must choose the correct definition among six choices. Since the value of the correct answer is linked to a counter that is constantly counting down, the quicker the correct answer, the more points awarded. Conversely, answering incorrectly subtracts the number of points on the counter. Thus there is a strategy to the game: one should either answer quickly, or, if in doubt guess only when the penalty is minimal.

The game has three levels of play. The beginner's level is for youngsters aged 9-14. Common words like "nuzzle," "swift," "daffy," and "coast" are used. The regular level is for high school students and beyond, and it is good review for students studying for the college entrance exam. Sample words include "disdain," "paeon," "pugnacious," "charisma," and "decapitate." The really challenging level uses words that are not commonly encountered. Several of these are "larrikin," "scatch," "oriel," and "mymy." As an example, the word "scride" is given with choices like "living in hedges, dance step for horses, crawl on all fours," etc. This level requires shrewd guesswork and a go for broke strategy.

The disk contains 2000 words, or about 650 words per level. There are plans to include additional word modules and a "Famous Names" game in the future. *Word Race* might be classed more as an educational program than a game, but either way it is a painless method of increasing one's vocabulary.

PUNCTUATION PUT-ON

Company: APX/Atari Program Exchange

Language: BASIC

Hardware Requirements: 32K

Department: Education

Sugg. Retail: \$34.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING **B-**
EDUCATIONAL VALUE **C+**
VENDOR SUPPORT **C**

EASE OF USE **A**
DOCUMENTATION **A**
VISUAL APPEAL **C**

ERROR HANDLING **A**
RELIABILITY **A**
VALUE FOR MONEY **C**

Punctuation Put-On targets children aged eight to fourteen. It drills you on punctuation by letting you choose from three stories or two poems. Your choice appears on the screen, giving you a chance to study the correct punctuation before the punctuation marks disappear and you fill them in again. Each selection includes twenty punctuation marks plus ten random marks. You can repeat the exercise as often as you like, and the score tells you your mistakes and the percentage of correct insertions. Other options in the Main Menu include a practice lesson in typing punctuation marks, a review, updating your score, and a display of the errors made for each punctuation mark.

The program runs well and responds quickly to input, and the documentation is clear and easy to understand. Unfortunately, *Punctuation Put-On* never explains why punctuation marks belong in one place rather than another. As a result, it stresses repetition rather than learning concepts of punctuation.

Mathematics & Science

EDUFUN! PROGRAMS

Company: Edufun, a division of
Milliken Publishing

Language: BASIC

Hardware Requirements: 16K cassette, 32K disk

Department: Education
Sugg. Retail: \$32.95 per package
of 2 programs

Availability: 7

Disk or Tape: Both

OVERALL RATING **A**
EDUCATIONAL VALUE **A**
VENDOR SUPPORT **B**

EASE OF USE **A**
DOCUMENTATION **A**
VISUAL APPEAL **A**

ERROR HANDLING **A**
RELIABILITY **A**
VALUE FOR MONEY **A**

Edufun has produced a unique series of educational arithmetic programs that are both challenging and fun to operate. Not only are the concepts presented appropriate for the age level intended, but a wide range of difficulty levels are provided for the student. Every package includes a creative reward system with excellent visual appeal. One of the most positive features of this series is Edufun's documentation. Re-usable scorecards, game cards, and useful suggestions for teachers and parents are included with every program. These serve to enhance and reinforce the concepts presented.

There are two programs included in each package. *Aliencounter* and *Faceflash* are appropriate for ages five through nine. The student must land the appropriate number of aliens on earth by counting correctly and recognizing numbers to score in *Aliencounter*. Counting is also required in *Faceflash*; however, here the student must also rely on his memory to recall when the smiling faces are flashed on the screen.

Elementary probability, direction, and color and shape discrimination are presented in the *Jar Game* and *Chaos*. Six through ten year old students are required to land a buzzing fly on the correct jar in the *Jar Game*. *Chaos* requires careful movement and placement of a spaceship in order to capture alien satellites.

Answer the multiplication and addition problems correctly or the big fish will "gulp" the little ones in the program neatly titled *Gulp*. Follow the traveling arrow and retrace its path in *Arrow Graphics* and you'll accumulate points. These games are appropriate for children between the ages of seven and twelve.

Angle and measurement estimation are required in *Golf Classic*. One must read graphs while playing *Compubar*, as well as construct arithmetic expressions. Both games are appropriate for ages nine through ninety-nine.

In *Frenzy*, quickly subtract or divide to avoid the "frenzy" of the fish being eaten by an alligator. Transformational geometry is presented in *Flip Flop*, as the student decides to flip, turn, or slide the geometric figures. Nine through twelve year olds will enjoy *Frenzy* and *Flip Flop*.

Finally, the student must battle the bugs with positive and negative numbers, and play concentration with fractions in the *Battling Bugs* and *Concentration* disks, respectively.

With the use of simple key input commands, children will discover that these clever programs are easy to use, as well as enjoyable to play. Parents and teachers will find them extremely worthwhile in their educational value.



GOLF CLASSIC



GULP & ARROW GRAPHICS

COMPU-MATH

Company: Peachtree Software
Language: BASIC
Hardware Requirements: 48K

Department: Education

Sugg. Retail: \$39.95

Availability: 8

Disk or Tape: Both

OVERALL RATING **B**
EDUCATIONAL VALUE **A**
VENDOR SUPPORT **B**

EASE OF USE **A**
DOCUMENTATION **A**
VISUAL APPEAL **C-**

ERROR HANDLING **B**
RELIABILITY **A**
VALUE FOR MONEY **B**

Edu-Ware's *Compu-Math* programs are tutorial programs designed for elementary students who already have an understanding of basic arithmetic skills. Although the programs lack colorful graphics, sound effects, or frills, *Compu-Math* programs are an ideal resource for teachers to use as a supplement to classroom instruction.

Each program's menu contains a diagnostic pre-test to determine the student's math skills level. After the child has taken the pre-test, the computer recommends which unit the student should begin to work on. Objectives are featured at the beginning of each unit.

Compu-Math Fractions uses illustrations of divided rectangles to demonstrate its math concepts. The program contains lessons on the definitions and parts of fractions, denominators, addition, subtraction, multiplication, and division of fractions. Lessons covered in *Compu-Math Decimals* include the conversion of fractions to decimals and decimals to fractions; addition, subtraction, multiplication, and division of decimals; rounding of decimals; and percentages. The clear-cut, step by step explanations of each concept are simple to follow. Many of the practice exercises have a trial and error re-loop built into the learner responses, so the student may continue to work on the practice exercises until he feels he is ready to take the test at the end of the unit.

Each test contains ten problems with multiple choice answers. If the student's answer to a given problem is correct, a tone sounds and the next problem appears on the screen. If the answer is incorrect, a buzzer sounds and an arrow points to the correct answer. After all problems have been completed, the computer totals the score, lists the results, and recommends that the student either re-do the unit or proceed to the next.

One weakness is worth noting. If the wrong key is accidentally typed during a practice exercise or test, there is no way of changing the incorrect answer before it is registered in the computer. It might have been more effective to program the use of the Delete key if the wrong key is pressed, and to require the use of the Return key before the answer is registered.

The authors maintain that the *Compu-Math* programs can be used in several ways. Inside the classroom the teacher can use the program for individualized or group instruction, though individual work should be undertaken with caution since a child could soon become bored with the program if left on his own. Although each concept is presented in a simple and understandable fashion, there is nothing in the program that makes learning "fun." Except for the classical melody played at the beginning of the program, and the buzzer sounded during the exercises, the program makes no use of the wide range of sound effects available on the Atari. Nor are the graphics colorful or detailed.

In spite of these weaknesses, the program could be extremely effective as a group instructional tool, making the overhead projector obsolete. The teacher could easily explain each concept to a class while using the computer monitor as a visual aid. *Compu-Math's* well written explanations and examples, along with the immediate feedback available to the student's responses, make it a worthwhile educational expenditure.

METRIC & PROBLEM SOLVING

Company: APX/Atari Program Exchange
Language: Atari Basic
Hardware Requirements: 16K, disk drive.

Department: Education

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING **B**
EDUCATIONAL VALUE **B**
VENDOR SUPPORT **C**

EASE OF USE **B**
DOCUMENTATION **B**
VISUAL APPEAL **B-**

ERROR HANDLING **B**
RELIABILITY **B**
VALUE FOR MONEY **B-**

Metric and Problem Solving presents seven challenging games encompassing a variety of math concepts applicable to second through sixth grade students. The concepts include metric length and conversion, graphing, number lines, direction, estimating metric measurement, numerical order, prime numbers and factors, place values, and logic. Documentation includes a good support booklet with handouts for duplicating lessons and suggestions for the teacher to reinforce the lessons presented. The visual appeal could stand some thought and improvement.

THREE R MATH CLASSROOM KIT

Company: Atari Program Exchange

Language: BASIC

Hardware Requirements: 40K; printer.

Department: Education

Sugg. Retail: \$49.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING
EDUCATIONAL VALUE
VENDOR SUPPORT

B+
A-
C

EASE OF USE
DOCUMENTATION
VISUAL APPEAL

A
A
B-

ERROR HANDLING
RELIABILITY
VALUE FOR MONEY

A
A
A

Three R Math Classroom Kit is a supplementary math program designed for students from kindergarten to eighth grade. To use the kit requires at least one disk drive, several blank disks, and an Epson or Atari printer. The kit contains four disks and is divided into three parts: "Three R Math System," "Three R Math Practice Worksheets," and "Three R Math Gradebook."

"Three R Math System" also includes separate teacher and student disks. The documentation furnishes code letters for the teacher to create individual passwords for different students. Each element of a password describes a specific kind of drill. For example, the teacher can give the student five subtraction problems of a two digit number subtracted from a three-digit number with no regrouping, each problem to remain on the screen for a maximum of fifteen seconds. This feature permits the teacher to individualize the math drills for each student's needs. After the drill has been completed, a summary of the results is displayed; the results can also be stored to disk and printed out.

"Three R Math System" uses an interesting means of positive reinforcement during the drill. After the correct answer has been entered, the screen flashes, the sound of a fireworks explosion is heard, and various words of praise appear, some of which include the user's name: "Good job, Keith! Super! Great! Wow!" These words of praise continue until the user presses the RETURN button to invoke the next problem. Although this reinforcement is initially amusing, it ages fast. For further reinforcement, after the student has completed all the problems, a letter from "Smedley" appears on the screen, congratulating the user by name on his efforts. Although the use of "Smedley" is a cute touch, it is hardly appropriate for upper grade levels.

"Three R Math Practice Worksheets" are recorded on one of the kit disks. Using this routine, the teacher may print "custom tailored" worksheets to supplement what the student is learning on the computer. The teacher also has the choice of printing practice pages of problems with answers, without answers, or with answers for every other problem. This feature saves valuable preparation time. Using the worksheets obviates the need to spend hours preparing original worksheets.

Another time-saving feature is "Three R Math Gradebook," which allows the teacher to record individual student progress, store it on disk, and print it for later use. This feature allows the teacher to escape hours of calculating grade averages.

The documentation is excellent. The step-by-step instructions, though lengthy, are clear and easy to follow. *Three R Math Classroom Kit* is an excellent instructional tool which should only be used in conjunction with a math textbook, and not as an independent course of instruction. The program is best suited to younger students. The only use for it in the upper grades would be as remedial work. The program makes no use of fractions, decimals, or percentages, nor does it contain story problems. Although the author suggests that the program is suitable for both teachers and parents, parents would have no use for the "Gradebook" disk. The program's most effective use is inside the classroom.

EDU-WARE FRACTIONS

Company: Peachtree Software

Language: Atari BASIC

Hardware Requirements: 32K cassette, 48K disk.

Department: Education

Sugg. Retail: \$29.95 cassette / \$39.95 disk

Availability: 6

Disk or Tape: Disk*

OVERALL RATING
EDUCATIONAL VALUE
VENDOR SUPPORT

B+
A-
A-

EASE OF USE
DOCUMENTATION
VISUAL APPEAL

A
A-
B

ERROR HANDLING
RELIABILITY
VALUE FOR MONEY

A-
A-
B-

Edu-Ware Fractions is a graphically-enhanced version of the previously released *Compu-Math Fractions*. The problem in reading fractions formed from inverse blank spaces has been overcome by the use of a very readable set of characters and figures in a shape-table. The use of color is minimal, and not vital to the working of the programs, so that it is quite possible to use black and white monitors for this package.

There is an extensive, well-prepared Learning Manager Master Menu which is designed for the teacher/parent to set up the package and present it to the student/child. It is possible to pre-program the units to be tested (definitions and parts of the fraction, denominators, addition of fractions, subtraction of fractions, multiplication of fractions, and division of fractions). Administration of a pre-test or post-test can be chosen, as can the number of questions in each unit. Sound effects can be "on" or "off" for answer entry and correction feedback. The number of incorrect responses for a practice problem before being taken back to review the material can be pre-planned. There are other very desirable controls available as well.

A previous review pointed out a very serious flaw in the earlier package. Namely, in using the common denominators formed by multiplying all of the denominators together rather than using the lowest (least) common denominator. This has not been completely corrected. If anything, there are some additional shortcomings introduced in the current version. On parts of the package, determining the reduced form of the answer is encouraged, in fact demanded — even when the answer was already in that form. The use of zero as a numerator when the result of the problem was a whole number answer is also questionable.

In addition to the inconsistent attempt at simplifying techniques, there are serious problems with the way user-responses are accepted by the program. In an attempt to control input, fields have been established on the screen. This would be a valid approach if there was a way of controlling the length of those fields as determined by the question. For example, if the field length is set for 3 digits, and the correct response was 100, then upon pressing 1, 0, and 0, the program would automatically continue; but if the correct response is 9, the user would have to press the space bar twice before the program would accept the answer and continue. To compound this difficulty, some parts of the package do not accept input without pressing (return).

The difficulty, or more precisely, the danger in allowing this package to be used by students can best be seen by an actual example:

(Note: underlining indicates my response)

$$1 \quad 2/4 \times 1 \quad 2/6 = ?$$

$$1 \quad 2/4 = \underline{3/2} \qquad 1 \quad 2/6 = \underline{40/30}$$

$$3/2 \times 40/30 = \underline{240/120}$$

2 ??/?? (?'s were input prompts, pressing spaces produced
"Try again.") Finally the correct answer was shown:

One answer is 240/120

What is probably most annoying is the realization that this package could have almost been an ideal tool to use in the classroom and in the home. To this reviewer, the shortcomings could have been overcome by more care in coding. The use of random problem generation is the chief culprit in producing these bizarre results. Admittedly, the program would be longer, and repetitive, but some topics require absolute control — fractions is obviously one of those topics.

NOTE: The learning manager which records teacher adjustments of difficulty and lesson sequence to the disk, and also keeps track of each student's progress, is not available on the cassette version.

FRACTION FACTORY

Company: Counterpoint Software, Inc.

Language: BASIC

Hardware Requirements: 48K

Department: Education

Sugg. Retail: \$29.95

Availability: 3

Disk or Tape: Both

OVERALL RATING **B+**
EDUCATIONAL VALUE **B+**
VENDOR SUPPORT **B-**

EASE OF USE **B**
DOCUMENTATION **B-**
VISUAL APPEAL **B+**

ERROR HANDLING **A**
RELIABILITY **A**
VALUE FOR MONEY **B+**

Fraction Factory, an educational program for children in the third through sixth grades, teaches fractions with a pleasant mix of sound, color, and animation. The program itself has five major categories: adding fractions, subtracting fractions, fractions of a number, equivalent fractions (finding fractions which are equal but have different denominators), and fractions and sets (finding the percent of objects contained within a box as compared to the total number of objects on the screen). A simple yet pleasant animation sequence lists the correct answers after each learning area is completed.

The program loads itself and is simple to use. The manual includes instructions for several computers, so it takes a few extra minutes to be sure of the prompts in the Atari version. The program overall is interesting, pleasant to the eye, and aids in the teaching of fractions.

FRACTION PROGRAM

Company: Peninsula Instant Replay

Language: BASIC

Hardware Requirements: 24K (disk); 16K (cassette)

Department: Education

Sugg. Retail: \$15.00

Availability: 2

Disk or Tape: Both

OVERALL RATING C-
EDUCATIONAL VALUE C
VENDOR SUPPORT B

EASE OF USE C-
DOCUMENTATION A-
VISUAL APPEAL D+

ERROR HANDLING A-
RELIABILITY B+
VALUE FOR MONEY C+

Fraction Program is designed to quiz and instruct students in the manipulation of mathematical equations involving fractions. The program adds, subtracts, multiplies, and divides simple or complex (mixed number) fractions. It accepts fractions entered by the user (homework checking), or makes up fraction problems as a drill. The learning process is reinforced by happy/sad face graphics, and sound, as well as a scoring report at the conclusion of each quiz. Also included is an explanation of the intermediate steps of answering the fraction problem, which is provided when the student errs.

The program did not autoload, although according to the documentation an autoloading program is available. Timed screen displays (title, instructions, and scorecard) appear on the screen too briefly to be read. Text graphics are sloppy without regard to word hyphenation at the end of a line. The program's attempt to show the intermediate steps in the calculation is laudable and useful; however, it would be much more useful in a form which used smaller graphics and less abbreviations than the table given here.

Fraction Program performed reliably once the directions were deciphered. Despite its faults, its low cost and good conceptual hold on teaching fractions make it a fair buy for the classroom or home setting.

MONKEY UP A TREE

Company: Atari Program Exchange

Language: BASIC

Hardware Requirements: 24K

Department: Education

Sugg. Retail: \$22.95

Availability: 6

Disk or Tape: Both

OVERALL RATING A
EDUCATIONAL VALUE B+
VENDOR SUPPORT C

EASE OF USE A
DOCUMENTATION A
VISUAL APPEAL B

ERROR HANDLING A-
RELIABILITY A
VALUE FOR MONEY A

Monkey Up a Tree is a simple math game for children in elementary grades. Depending upon whether one or two children are playing, one or two hungry monkeys stand beneath a tree, waiting to climb to the top to pick a banana. The only way the monkey can reach the banana is for the player to solve an addition, subtraction, multiplication, or division problem placed at the bottom of the screen.

If the player types the correct answer, the monkey climbs a short distance toward the top. If the wrong answer is typed, or the player waits too long to answer, the monkey slides part way down the tree, and the correct answer displays on the screen. Once the monkey reaches the top of the tree, it picks one banana, jumps down, and eats it. The player whose monkey is the first to pick three bananas wins.

Monkey Up a Tree is an ideal learning game for adults to play with their children. The game's handicapping feature causes the problems to become increasingly difficult in proportion to the player's speed and accuracy. Skilled players quickly move to problems that are more challenging, while the program keeps the less advanced players at the lowest level at which they encounter difficulty. This feature allows children to compete with adults on a nearly equal basis.

Documentation is concise and simple to follow. Players will have no problem understanding how to use the program. The graphics, though detailed, are limited to different shades of green, except for the monkeys and the unrealistic bananas. The author also added a couple of amusing touches such as the wagging of the monkey's tail and the eating of the banana.

Monkey Up a Tree does not make extensive use of sound effects, but it does play a cute melody every time it registers a correct answer. The tune increases in pitch as the monkey climbs higher. The only other sound effect occurs as the monkey slides down the tree when an incorrect answer is typed.

Monkey Up a Tree is a clever, creative variation of the old fashioned ciphering match, where speed and accuracy in problem solving are musts for winning the game. Teachers and parents will appreciate its educational value; children will enjoy its competitive side.

COUNTER

Company: Atari Program Exchange

Language: BASIC

Hardware Requirements: 24K

Department: Education

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING **B**
EDUCATIONAL VALUE **C+**
VENDOR SUPPORT **C**

EASE OF USE **B**
DOCUMENTATION **B-**
VISUAL APPEAL **A-**

ERROR HANDLING **A**
RELIABILITY **B+**
VALUE FOR MONEY **B**

Designed for children aged two to seven, *Counter* seems to me one of the most colorful and creative counting programs presently available. Any child would enjoy the program. Not only are the graphics delightful, the program provides for counting up to fifteen in four languages: English, French, German, and Spanish. Questions can be answered by using the Space Bar and other keyboard inputs, by paddle controller, or by joystick. The program offers six skill levels, chiefly differentiated by the length of time you are allotted for entering your answers. The easier levels offer a long time limit, while the last three levels grow progressively shorter.

There are two parts to *Counter*, "Count With Me" and "It's Your Turn." The first part displays five-legged creatures called "Corks" from Atariland, and chimes as each one is presented. The number of objects and the word for the number are presented at the bottom of the screen. The program speed can be controlled by depressing the "1" or "2" keys.

During "It's Your Turn," the child has the opportunity to count the variety of colorful objects presented on the screen and enter the appropriate number. If the child answers correctly the screen turns green and a short melody is played. If the answers are incorrect the screen flashes orange and yellow. The program will not continue until you select the correct answer, a feature which has the potential to frustrate the young learner. The number of correct and incorrect answers is available if you press the "Atari" key.

The small child not only learns how to count, he is introduced to other languages as well. The number and the foreign word for the objects presented on the screen are included. It's an interesting program that seems to me worth the money.

NUMBER RELATIONSHIPS

Company: Edupro

Language: BASIC

Hardware Requirements: 16K cassette; 24K disk

Department: Education

Sugg. Retail: \$24.95

Availability: 7

Disk or Tape: Both

OVERALL RATING **B**
EDUCATIONAL VALUE **B+**
VENDOR SUPPORT **B+**

EASE OF USE **B-**
DOCUMENTATION **B-**
VISUAL APPEAL **D-**

ERROR HANDLING **B**
RELIABILITY **B**
VALUE FOR MONEY **B**

Number Relationships is an education package for kids five to nine-years old. It can accommodate from one to four players. The first game, "There Was An Old Woman," teaches children the concepts of less-than, equal-to, and greater-than. Kids can choose to work with either integers or fractions, selecting either a short or long version of the game.

The second game, "Numbers and Numerals," teaches children to associate a number such as "three" with its corresponding numeral, "3." The program randomly selects a range of numbers and challenges either a single player or a group to race against time and correlate numbers and numerals. The third game, "Shapes and Stars," challenges students to count asterisks in determining whether a group of stars is greater-than, equal-to, or less-than another group of stars.

Numeric Relationships accomplishes its primary objective of teaching the basics of arithmetic to young children. An individual child can use the program to learn mathematical concepts, while a group of kids will be delighted by the competitive aspect of the program. As with most products from Edupro, *Number Relationships* is light in its use of the sound and graphics capabilities of the Atari system. Aside from a plain vanilla Graphics Mode 2 title screen, the entire program unfolds in Graphics Mode 0. There is a problem with the contrast setting; it is difficult to distinguish a 0 from a 6. You can correct the problem by changing the 14 to a 10 in line number 2690 of each of the games.

Overall, the program is a winner. It brings a rare quality to the educational marketplace: education. If you're looking for an upbeat vehicle to reinforce your kids' mathematical prowess, then *Number Relationships* is for you.

MONKEYMATH

Company: Artworx

Language: BASIC

Hardware Requirements: 16K

Department: Education

Sugg. Retail: \$28.95 Disk; \$24.95 Cassette

Availability: 6

Disk or Tape: Both

OVERALL RATING **A-**
EDUCATIONAL VALUE **A-**
VENDOR SUPPORT **B+**

EASE OF USE **A-**
DOCUMENTATION **B**
VISUAL APPEAL **B+**

ERROR HANDLING **A**
RELIABILITY **A**
VALUE FOR MONEY **A**

Monkeymath is a cleverly designed educational program which combines elements of an arcade game with teaching basic arithmetic skills. Users have a choice of three skill levels and five operations: counting, addition, subtraction, multiplication, or division.

The graphics are not overly colorful, but they are well drawn. In a number factory run by apes a conveyor belt carrying digits moves along near the top of the screen. A monkey stands above the conveyor belt and can be moved left or right by using the joystick. At the bottom of the screen, a simple math problem appears. Pressing the fire button will cause the monkey to hit a number and drive it into the answer slot. If the answer is correct, the player scores fifty points. Chimps at the bottom of the screen carry the number off and bring out a new problem. Incorrect answers are removed without penalty.

The documentation is generally clear and concise, but the counting game contains no instructions, leaving the player to experiment by trial and error. In the counting game a three-digit number appears briefly at the bottom of the screen; one digit disappears and the player is expected to identify the missing digit. Without the instructions, the player does not know how to play the game.

Each game lasts for approximately one minute and is the equivalent of one shift commencing at eight o'clock. At lunch and at the end of the shift (five o'clock) the monkey takes a break and eats "bonus bananas," awarded for each correct answer after the first five. These bananas also add to the player's score. In addition to the fine graphics, sound effects are cleverly executed. The sounds of the conveyor belt and the blowing whistles at the beginning and end of each shift are nice touches.

Monkeymath is an ideal teaching game for elementary school children. Without realizing it, children will learn basic arithmetic skills while playing a fun game at the same time. Both parents and teachers will find the program extremely useful.

MUSICAL MATHEMATICS

Company: Hayden Software

Language: BASIC

Hardware Requirements: 32K

Department: Education

Sugg. Retail: \$34.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING **C**
EDUCATIONAL VALUE **C+**
VENDOR SUPPORT **B**

EASE OF USE **C**
DOCUMENTATION **B**
VISUAL APPEAL **C**

ERROR HANDLING **B**
RELIABILITY **B**
VALUE FOR MONEY **C**

The documentation to *Musical Mathematics* promises an exciting computer math game. Unfortunately, the program is about as exciting as flash card drill—it reinforces the concept, but it is not entertaining. From a poorly constructed menu display (not easy in itself for the young child to use), the student chooses from one of the four basic math functions: addition, subtraction, multiplication, and division. Each function can be operated from one of three levels, the beginner, intermediate, or expert. Such familiar tunes as "I've Been Working on the Railroad" are played throughout the game. A running score is displayed as the game progresses, and at the end of ten questions the total score is given.

I found one disconcerting feature on the intermediate and expert levels of the program concerning two and three digit problems. The student must enter answers from left to right. In the classroom, however, the student is taught to write his answer working from the righthand column to the left. This has the potential for causing some confusion.

The relationship between music and mathematical concepts has long been recognized, and a program combining the two is a natural for the computer. But it could have been more effectively implemented by using better graphics. The documentation, which describes some possible game variations using the program, makes the misleading suggestion that this math game is applicable for preschool students all the way up to the adult level.

ESCAPE TO EQUATUS

Company: APX
Language: BASIC
Hardware Requirements: 24K

Department: Education
Sugg. Retail: \$24.95
Availability: 9
Disk or Tape: Both

OVERALL RATING A-
EDUCATIONAL VALUE B+
VENDOR SUPPORT B

EASE OF USE A-
DOCUMENTATION A
VISUAL APPEAL B

ERROR HANDLING A-
RELIABILITY A
VALUE FOR MONEY A-

Escape to Equatus combines the fun of an arcade shoot-'em-up game with simple arithmetic problems. Children will enjoy this cleverly designed math game because of its effective use of sound effects and graphics. Even the documentation sounds like the description of a video game: "Many light years ago in a distant galaxy, the planet Mathema collided with a meteor. The planet was completely destroyed, but moments before the end, a small band of Mathemen escaped aboard the giant robot ship Metrica." At the beginning of the game, the Metrica lands in a crater on the moon Equatus, leaving the Mathemen and a Solutus fighter behind (two fighters wait in reserve). Meanwhile, an Equacian battle cruiser trailing an arithmetic problem appears on the screen. Underneath the problem drifts a "lethal number line" which slowly descends toward the bottom of the crater. Using a joystick, you maneuver your Solutus fighter beneath the correct digit in the number line, press the firing button, and shoot the digit with a laser. If you choose the correct answer to the problem, you score points. You also face another cruiser soaring overhead with another math problem. If your answer is wrong, the number line continues to descend. You can erase the number for your answer by pulling the joystick forward. If you wait too long to shoot the correct number, your ship is destroyed and several of the Mathemen dematerialize to reappear in an "underground cavern." After you have destroyed all three ships, a cruiser will appear trailing the missed problems. Again, you have the opportunity to shoot the correct answer. If you succeed, the immobilized Mathemen return to the crater and the game proceeds.

The game has four levels of skill. The easiest level contains simple addition and subtraction of numbers from one through five. The most difficult level contains addition, subtraction, multiplication, and division of numbers from six to twenty-four. The speed of the number line's descent increases with each level.

The graphics are well drawn and colorful. The only minor weaknesses are the jerky movements of the Solutus fighters and the number line, which could frustrate small children playing the game. In spite of this, *Escape to Equatus* is an ideal game for children in the primary grades. They can enjoy playing a game while drilling with basic math facts.

VIDEO MATH FLASHCARDS

Company: Atari Program Exchange
Language: Atari BASIC
Hardware Requirements: 8K cassette; 24K disk

Department: Education
Sugg. Retail: \$17.95
Availability: 8
Disk or Tape: Both

OVERALL RATING C
EDUCATIONAL VALUE B
VENDOR SUPPORT C

EASE OF USE B
DOCUMENTATION B
VISUAL APPEAL C+

ERROR HANDLING A
RELIABILITY A
VALUE FOR MONEY C+

Video Math Flashcards is a no frills program to drill students on basic math facts. The drill lasts for two minutes, and you may choose from addition, subtraction, multiplication, or division, either in 0-9 order or in random order. You may also choose to practice a particular number, or to mix all the function for all numbers.

A review follows the drill. The computer presents up to 20 unsolved or incorrect problems. If you enter the wrong answer a second time, the correct answer is supplied, and will be presented once more during the run of the program. A score next appears consisting of wrong answers subtracted from right ones, and the student's performance is finally ranked.

This program is a bit boring, but it gets the job done, and is a more efficient system than flash cards made by the student. The computer's potentials could be more effectively utilized, however, if the student were to write his own program and drill himself on these math skills.

MATH MISSION 1.0

Company: APX/Atari Program Exchange

Language: BASIC

Hardware Requirements: 16K tape, 24K disc

Department: Education

Sugg. Retail: \$24.95

Availability: 8

Disk or Tape: Both

OVERALL RATING **B+**
EDUCATIONAL VALUE **B**
VENDOR SUPPORT **C**

EASE OF USE **B**
DOCUMENTATION **B**
VISUAL APPEAL **B+**

ERROR HANDLING **B-**
RELIABILITY **A**
VALUE FOR MONEY **B**

Math Mission, a drill and practice program for basic arithmetic skills, lets you practice one or more math skills at once using integers only, no fractions or decimals. *Math Mission* takes the form of a game, in this case a rather primitive one. You get a rocket ship graphic, a fuel indicator, and scrolling terrain. At the top of the screen is the current problem and the score bar. You must answer the questions correctly to keep your ship in flight. Wrong or slow answers cause you to lose fuel, while correct answers win added fuel. When you lose all of the fuel, the ship crashes and the game ends. If you keep the ship flying for a set time, you win bonus points, a complete refueling, and a new planet to conquer. Along the way you can win special bonuses for an unbroken string of correct answers or just for getting many problems right. Each planet lasts about thirty seconds, and you face several levels of difficulty which affect how quickly your ship burns fuel. The beginning problems are easy, with small numbers, but the numbers increase gradually with each new planet. As far as I could tell, there is no limit to the increase. You can continue to play until you run out of fuel or get tired and quit.

The graphics are adequate, if not tremendous. The scrolling terrain varies within narrow limits from planet to planet, and uses a redefined character set. Most of the time you focus on the problems at the top of the screen, anyway. The sound effects are well done, with a roar for the ship in flight and various bleeps, blips, and buzzes for right and wrong answers and bonuses. Cycling of the color register, a mark of many Atari games, also signals bonuses. The noise would probably create a distraction in a classroom.

You can play the game with a joystick or keyboard, although the joystick is too slow for the higher levels. Anyone at all comfortable with a keyboard will probably prefer to use it. The worst problem is that you cannot correct a mistake. You cannot backspace, and must complete an answer that you know is wrong and take the penalty before you can enter the correct answer. Moreover, you cannot bypass the early stages to move directly to the harder problems. You may also have problems with two-digit numbers because the format is horizontal rather than vertical.

Math Mission does make drilling on math skills more interesting than the boring traditional approach, particularly for students who prefer video games.

ALGICALC

Company: APX/Atari Program Exchange

Language: Basic

Hardware Requirements: 24K [tape]
32K [disk]

Department: Education

Sugg. Retail: \$24.95

Availability: 8

Disk or Tape: Both

OVERALL RATING **B+**
EDUCATIONAL VALUE **C+**
VENDOR SUPPORT **C**

EASE OF USE **B+**
DOCUMENTATION **B-**
VISUAL APPEAL **C+**

ERROR HANDLING **A-**
RELIABILITY **A-**
VALUE FOR MONEY **B+**

Algicalc performs operations in both algebra and calculus. It is NOT a teaching or learning device, but can be used by both students and professionals who have some background in algebra or calculus.

Those experienced in these areas will have little difficulty familiarizing themselves with the features of *Algicalc* by reading the manual or reviewing the seven HELP topics. Both the manual and the HELP topics give good examples which will eventually lead, with a little experimenting, to understanding the various uses of this program. (There are, however, some minor errors in the manual which can be misleading to the beginner.)

The manual would be a more helpful learning tool if it gave graduated examples, and more of them. That is, when a HELP topic appears on the screen, the correct answer should appear in order to verify the user's response. As it is, the first HELP screen is illustrated in the manual, and all of the answers are given; but the other HELP screens are not illustrated and lack corresponding answers. Thus, there is no way for the user to be sure that he is correctly executing the example problems. It would also be useful if more examples were given of how an algebraic expression, such as,

$$\begin{array}{r} 4 \\ X - 1 \\ \hline 3 \quad 2 \\ X^3 + 2X^2 + X + 2 \\ \hline (X^4 - 1)/(X^3 + 2X^2 + X + 2) \end{array}$$

should be entered in the computer. The format required is,

but this is not clearly presented.

It is essential that the user read the section of the manual on "expressions" to see how *Algicalc* treats such things as variables and the order of operations. Those who must evaluate algebraic expressions will find this feature of *Algicalc* interesting and useful. Expressions to be dealt with must contain only one variable (which must be "X"), and are limited only by the memory in the computer and the imagination of the user. In order to work with more than one variable, manual substitutions must be made, and are not usually dealt with satisfactorily by *Algicalc*.

The factoring feature is very good with some expressions, but not too helpful on others, particularly those polynomials which do not have a coefficient of one for the first term. There doesn't seem to be much rhyme or reason to what happens with others.

The one small page in the manual devoted to calculus deals only with the subject of derivatives. Those expecting more may be disappointed. Some other areas covered by HELP topics are: Assignments, Non-display, Substitution, and Compound Lines. The Substitution feature allows the user to evaluate the simplified expression for any value of the variable, X.

Even though *Algicalc* is not a particularly good teaching device, it can be used to great advantage by the teacher to demonstrate the capabilities of the computer in dealing with algebraic expressions. The students will find it most helpful in taking the drudgery out of calculations and in verifying the accuracy of their work.

POLYCALC

Company: APX/Atari Program Exchange
Language: Atari Basic
Hardware Requirements: 24K cassette, 32K disk.

Department: Education
Sugg. Retail: \$24.95
Availability: B
Disk or Tape: Disk

OVERALL RATING **B**
 EDUCATIONAL VALUE **B**
 VENDOR SUPPORT **C**

EASE OF USE **B**
 DOCUMENTATION **B**
 VISUAL APPEAL **N/A**

ERROR HANDLING **A**
 RELIABILITY **A**
 VALUE FOR MONEY **B**

Polycalc is a program designed to aid students, teachers, and professionals with algebraic and calculus operations. It is not a tutorial or teaching device, but a computational tool for performing symbolic algebra and calculus functions. *Polycalc* does not require numerical values to be assigned to all variables before evaluating an expression. Instead, it operates a polynomial system which permits fractional and negative powers of variables — an advantage to the professional and student alike. Simply type in an expression and the program will expand, integrate, or differentiate the expression at the user's request. It is a versatile program capable of assigning results to variables for use in later expressions. Excellent documentation provides a thorough explanation of the program.

NUMBER BLAST

Company: APX/Atari Program Exchange
Language: Atari Basic
Hardware Requirements: 16K cassette, 24K disk.

Department: Education
Sugg. Retail: \$17.95
Availability: B
Disk or Tape: Both

OVERALL RATING **B**
 EDUCATIONAL VALUE **B**
 VENDOR SUPPORT **C**

EASE OF USE **B**
 DOCUMENTATION **B**
 VISUAL APPEAL **C**

ERROR HANDLING **B+**
 RELIABILITY **B+**
 VALUE FOR MONEY **B**

Number Blast is a multiplication and addition drill involving one or two players. Students will enjoy using joysticks to compete for the most points, or, in the single player mode, to compete with oneself. The program presents multiplication and addition tables as well, which are helpful to the student's progress. A shortcoming to the program's overall effectiveness is its poorly done graphics, which could stand improvement. Though not specified in the documentation, *Number Blast* is most appropriate for ages 6-16.

PIECE OF CAKE

Company: Counterpoint Software, Inc.

Language: Atari BASIC

Hardware Requirements: 48K

Department: Education

Sugg. Retail: \$29.95

Availability: 3

Disk or Tape: Both

OVERALL RATING **C+**
EDUCATIONAL VALUE **C+**
VENDOR SUPPORT **B-**

EASE OF USE **A**
DOCUMENTATION **B+**
VISUAL APPEAL **A-**

ERROR HANDLING **A**
RELIABILITY **A**
VALUE FOR MONEY **C+**

Piece of Cake is a set of five math games with a bakery theme. The Bakery involves adding and subtracting cakes as they are baked and sold each day for a week. Multicake tells how many slices a cake can be cut into and asks for the total pieces produced. Dividacake asks for the number of pieces each slice must be cut into to produce the correct total. Flash Cards provides addition, subtraction, multiplication, and division problems. Catchacake is a game involving catching cakes before they hit the floor by solving arithmetic problems.

The use of color, sound, and animation to reinforce basic math concepts is well done. The games are interesting, if rather slow. In the first three programs, each problem is presented up to four times with different degrees of help provided. The way the programs are designed, the child never has to press Return after an answer. This is very convenient when working with young children.

The major problem with this package is that the authors seem confused about the age group they are addressing. The format and speed of the games are designed for first or second graders. The documentation comments that the Picture Menu, which enables children to select a game, is an important feature. (The cassette version only contains the Word Menu.) This implies use by very young children who are just beginning to read. Each game, however, is a series of word problems which involve reading at a level appropriate to first or second grade. ("If a cake has nine slices and each slice has seven pieces, how many pieces in all?")

The math skill levels addressed in the program called The Bakery are for young children. The program shows each cake and asks for the total, which never exceeds twenty. The Cutacake and Dividacake programs work with multipliers and divisors up to ten. The Flash Cards program is divided into five levels for each of the four types of problems. While the format and speed of the games indicates that they are aimed at lower grade children, much of the math would require even upper elementary children to use pencil and paper to solve the problems. Older children would find the games tedious, while younger children would be unable to do the required math. As a result, the total package loses much of its usefulness.

ADDITION AND SUBTRACTION

Company: Edupro

Language: BASIC

Hardware Requirements: 16K cassette; 24K disk

Department: Education

Sugg. Retail: \$24.95

Availability: 6

Disk or Tape: Both

OVERALL RATING **B**
EDUCATIONAL VALUE **B+**
VENDOR SUPPORT **B+**

EASE OF USE **B**
DOCUMENTATION **C+**
VISUAL APPEAL **D-**

ERROR HANDLING **B-**
RELIABILITY **B**
VALUE FOR MONEY **B**

Addition and Subtraction is an education program for kids five to nine. While the single player game is the most popular, it can accommodate up to four players, and is made up of four separate games. The first, "One, Two, Three, Four, Five," is a fill-in game which teaches addition and subtraction using numbers from 0 to 10. The second, "One, Two, Buckle My Shoe," teaches addition and subtraction with numbers as large as twenty (in the easy level) to forty (in the difficult level).

The third game, "Going to See Big Ben," is a race game which reinforces basic mathematical skills. The last game, "Count By," is a maze game which teaches kids to count in increments of 2, 3, 4, or 5. *Addition and Subtraction* is a good drill program which fulfills its primary objective of educating young children. Don't buy the program if you're looking for something with strong graphics; this program doesn't have it. But it does do a nice job of teaching the basics of arithmetic.

MATHEMATIC TIC-TAC-TOE

Company: Atari Program Exchange

Language: Atari BASIC

Hardware Requirements: 16K cassette, 24K disk

Department: Education

Sugg. Retail: \$17.95

Availability: B

Disk or Tape: Both

OVERALL RATING **A**
EDUCATIONAL VALUE **A**
VENDOR SUPPORT **C**

EASE OF USE **B**
DOCUMENTATION **A**
VISUAL APPEAL **B**

ERROR HANDLING **A**
RELIABILITY **A**
VALUE FOR MONEY **A**

Mathematic-Tac-Toe is a math facts drill program turned into an interesting game. The screen displays a standard tic-tac-toe grid, and associates each cell with a math problem (not visible on the screen). The player chooses a cell, and the screen displays the associated problem. If it is answered correctly within the time limit, that cell is filled with an X or O, depending upon whose turn it is. If it is not answered within the time limit, the player loses his turn, and the opponent has the opportunity to choose the same cell or another.

There are 15 levels of difficulty and 15 time limits. The lower levels have longer time limits, and are appropriate for beginning students; but the upper levels should have been more challenging — the most difficult subtraction problems consist of only two and three digit numbers.

This program is an excellent way to sharpen math skills. The competition adds a new dimension to the drill, while the possibility of losing a turn makes tic-tac-toe a more interesting game.

MARATHON

Company: Educational Software

Language: BASIC

Hardware Requirements: 16K cassette, 24K disk

Department: Education

Sugg. Retail: \$20.00

Availability: 4

Disk or Tape: Both

OVERALL RATING **D+**
EDUCATIONAL VALUE **C-**
VENDOR SUPPORT **B**

EASE OF USE **B-**
DOCUMENTATION **C-**
VISUAL APPEAL **D**

ERROR HANDLING **B**
RELIABILITY **B**
VALUE FOR MONEY **D**

Marathon, a math quiz game, pits two people against each other in a race run by answering math questions correctly. (You can also play against the computer.) Questions cover multiplication, division, addition, and subtraction. The race offers four levels of difficulty, giving you less time to answer each question as you move from walker to jogger, sprinter, and Olympian. You begin with twelve seconds as a walker and end with two seconds as an Olympian. Every fifth question you must select multiples of the number presented. You use a joystick to indicate the correct answers, choosing from a grid of ten choices. The graphics are primitive, and the game concept simple. Unless you and your opponent are evenly matched, the less skilled player will become frustrated. At the end of the game, you must reenter the choice of game, number of players, and level of play—a tedious process. Better math quiz games exist.

THREE R MATH SYSTEM

Company: Atari Program Exchange

Language: Atari BASIC

Hardware Requirements: 48K, disk drive; printer recommended.

Department: Education

Sugg. Retail: \$24.95

Availability: B

Disk or Tape: Disk

OVERALL RATING **A**
EDUCATIONAL VALUE **A**
VENDOR SUPPORT **C**

EASE OF USE **A**
DOCUMENTATION **A**
VISUAL APPEAL **A**

ERROR HANDLING **A**
RELIABILITY **A**
VALUE FOR MONEY **A**

This versatile and flexible math program can be used for an entire school system, an individual classroom, or at home. Probably its single most worthwhile feature is its ability to create customized math drills for the student. One hundred and one difficulty levels of addition, subtraction, multiplication, and division are presented. They are sequentially designed so that the student can work on problems at his proper ability level and own pace. In addition, the speed, number of problems, and total time allowed can be specified and controlled. The student's results are summarized on the screen, saved, and printed at a later time; therefore, the teacher has a minimal amount of bookkeeping to attend to. *Three R Math System* is appropriate for kindergarten through eighth grade, and the package includes excellent documentation.

TEASERS BY TOBBS

Company: APX

Language: BASIC

Hardware Requirements: 16K

Department: Education

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING **C**
EDUCATIONAL VALUE **B**
VENDOR SUPPORT **C**

EASE OF USE **C-**
DOCUMENTATION **B**
VISUAL APPEAL **C**

ERROR HANDLING **N/A**
RELIABILITY **B**
VALUE FOR MONEY **C**

Teasers by Tobbs is a math drill and practice program for addition and multiplication with a twist. At the simplest levels it is a straightforward drill. Numbers to be added or multiplied appear in rows and columns, as in multiplication tables, and you fill in the answers. At the lowest levels, you may get some of the answers, but as the difficulty increases you have to answer more questions first. At the intermediate levels, you may get the sum or product and have to work backwards to find the numbers missing from the table. At the highest levels, you face many blank spaces and more than one answer is possible. At this point you need to determine whether the answer is fixed or lies within a range. At the end of each problem, the computer tallies your score and offers you the choice of continuing at the same level.

The presentation struck me as overly cute and the operation, clumsy. I would definitely not recommend it for children who do not like math, because it is a barely-disguised math drill. Quite simply, the user interface is poorly designed, partly because of trying to fit a disk-based program into 16K. Most Atari systems (on disk) have at least 32K or 48K, so 16K is a limitation here. It necessitates constant disk access and makes it difficult to move from one section of the program to another. Poorly designed nested menus and constant pushing of the Return key for no good reason further complicate using the program.

Sound and graphics are average. You see a problem grid, and Tobbs, a well-drawn character with owlsh glasses who shakes his head at wrong answers and occasionally jumps up and down or changes colors for right ones. He also points to the problem to be solved at any time. Some simple sound effects accompany his actions.

ENERGY CZAR

Company: Atari, Inc.

Language: BASIC

Hardware Requirements: 16K, cassette player.

Department: Education

Sugg. Retail: \$14.95

Availability: 8

Disk or Tape: Tape

OVERALL RATING **A-**
EDUCATIONAL VALUE **B+**
VENDOR SUPPORT **B+**

EASE OF USE **A**
DOCUMENTATION **A**
VISUAL APPEAL **B-**

ERROR HANDLING **A**
RELIABILITY **A**
VALUE FOR MONEY **A**

A simulation models or represents the function or process by means of the functioning of another. An example is flight simulation that duplicates, to a degree, the reality of actual flight; or a war game that recreates a famous battle. *Energy Czar* creates a model simulation of the existing energy sources in the United States. It must be remembered that the usefulness of any simulation is directly related to its ability to faithfully represent reality. *Energy Czar* should not be considered an "absolute" representation of our complicated energy resource situation, but it is nonetheless sufficiently accurate and thorough in its approach to be a valuable, entertaining, challenging, and useful educational tool.

The premise of the program is that the user has been appointed the "absolute Energy Czar" of the United States. The Czar has complete power to decide energy policy, and is mandated to solve the energy crisis. If he can do so, he'll be declared a national hero. As Czar, he must choose between fossil, nuclear, or solar power. Prices must be set or allowed to react to market conditions. Questions of supply must be answered, taxes have to be levied, and laws must be enacted. Fatal consequences of various policies must also be considered. Finally, the public (i.e., the computer) will judge your decisions in terms of how they have affected the growth of the economy, inflation, and overall quality of life. At this point, you are either voted out of office, or you become the hero.

Overall, *Energy Czar* is an entertaining, thought provoking, and nicely implemented educational program. It is especially suited for ages eight and up.

FROGMASTER

Company: APX/Atari Program Exchange

Language: BASIC

Hardware Requirements: 24K, disk drive. Joystick recommended.

Department: Education

Sugg. Retail: \$24.95

Availability: 3

Disk or Tape: Disk

OVERALL RATING C-
EDUCATIONAL VALUE C-
VENDOR SUPPORT C

EASE OF USE C-
DOCUMENTATION B
VISUAL APPEAL C+

ERROR HANDLING B
RELIABILITY B
VALUE FOR MONEY C

Frogmaster should be classed as an educational (rather than game) program because it demonstrates that animals, in this case tadpoles and frogs, can learn by conditioning. Inside each tadpole or frog shown on the screen is a primitive brain, entirely simulated by the computer. When an animal moves in a certain direction (and is rewarded by pressing the joystick button), it has a higher tendency to move in that direction in the future. If an animal is rewarded successively, then it begins to learn that jumping that way is the preferred direction.

Frogmaster gives this concept a game-like quality. Each player has a team of tadpoles. The team can consist of as many as nine. As the tadpoles begin to jump randomly, each player rewards their frogs for jumping in the correct direction, toward their opponent's goal. Each player has a joystick-controlled goalie to prevent any tadpole from scoring a goal.

While this game might have been played in a very straightforward way, it is complicated by the fact that none of these animals have any team loyalty. When a tadpole jumps, either player can reward a tadpole. Thus, a blue team member, after jumping the wrong way several times, may suddenly become a yellow team member. This is very disconcerting to a player, because only the tadpole's primitive brain knows whose order it received first. While this feature may make the game more interesting, it doesn't make the game very predictable, and so confuses younger players.

Besides being able to play at various speeds, the game offers levels in which tadpoles grow to become frogs that lay eggs and later die. If frogs can be properly guided, they can eat their opponent's eggs. On this level of play, frogs or tadpoles that are intercepted by the goalie die. A number of blockading walls can also be added to increase the difficulty.

I think the program is somewhat instructive to younger children. Teachers have the option of using the "tank" portion of the program to demonstrate conditioned learning without using the program as a game. But *Frogmaster* as a game wears thin after a few plays, and children soon become confused with the results.

STARWARE

Company: APX/Atari Program Exchange

Language: Atari Basic

Hardware Requirements: 40K, disk drive

Department: Education

Sugg. Retail: \$24.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING A-
EDUCATIONAL VALUE A-
VENDOR SUPPORT C

EASE OF USE B+
DOCUMENTATION B-
VISUAL APPEAL B+

ERROR HANDLING A
RELIABILITY A
VALUE FOR MONEY A-

If you or your child have an interest in learning the basics of astronomy, then this program is a good bet.

With *Starware*, you may locate the constellations in both the Northern or Southern hemispheres. There is a quiz format to assist you in learning about the constellations, and to help you identify them. The planets, the sun, and the moon can also be plotted with respect to star locations.

A "finder option" is available to assist you in locating an object. However, a basic astronomy book is definitely needed because the accompanying documentation does not go into sufficient detail to learn the necessary basics that are needed to fully utilize this program.

An interesting option allows you to display the night sky on the screen from your time and location anywhere from the year 1900 to 2000 A.D. This option, however, made me wish that the time span could have been longer; that is, I wished for an extension in time that would have allowed me to see how much the stars have changed position since, say, the birth of Christ.

All things considered, *Starware* is a good educational program for school age children as well as adults.

STATISTICS I

Company: Atari

Language: BASIC

Hardware Requirements: 16K cassette; 24K disk

Department: Education

Sugg. Retail: \$19.95

Availability: B

Disk or Tape: Both

OVERALL RATING **C**
EDUCATIONAL VALUE **C+**
VENDOR SUPPORT **B+**

EASE OF USE **B**
DOCUMENTATION **B**
VISUAL APPEAL **C**

ERROR HANDLING **A**
RELIABILITY **A**
VALUE FOR MONEY **C**

Statistics is considered by many to be a rather dull and uninteresting subject, and this introductory program further fosters that view. Not that the program doesn't provide an adequate introduction to such statistical terms as mean, mode, median, standard deviation, variance, skew, and root mean square. It does. However, by just going a little further, the learning process could have been a lot more interesting. Specifically, the program allows you to enter a database of information and will then proceed to calculate the results. That's fine as far as it goes, but a fuller treatment could have included a workbook of several problems to be solved by statistical analysis.

It would have also been a relatively simple matter to graph the statistical results, and thus visually demonstrate some of the useful applications to which statistics can be applied.

ELEMENTARY BIOLOGY

Company: APX/Atari Program Exchange

Language: Atari Basic

Hardware Requirements: 16K, disk drive.

Department: Education

Sugg. Retail: \$29.95

Availability: B

Disk or Tape: Disk

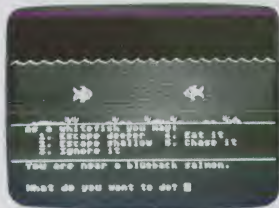
OVERALL RATING **B**
EDUCATIONAL VALUE **B**
VENDOR SUPPORT **C**

EASE OF USE **A**
DOCUMENTATION **A**
VISUAL APPEAL **B**

ERROR HANDLING **A**
RELIABILITY **A**
VALUE FOR MONEY **B**

Elementary Biology includes three programs for the elementary through junior high school student. They are as follows: (1) "Circulation" — this program describes the circulatory system of a fish. Color graphics are used to display the movement of a blood cell throughout the circulatory system. "Circulation" is appropriate for grades seven through nine. (2) "Odell Woods" aids the student in understanding food chains. As the student assumes the roles of animals found in the northern portion of the United States, food chains become of manifest importance. Students in grades two through eight will enjoy this simulation. (3) "Odell Lake" requires students to "role play" fish, and thus discover the food-web relationships by experimentation. As they encounter fish and other organisms in the environment, they must select appropriate actions in order to survive.

Elementary Biology is an informative and enjoyable package with excellent documentation. The objectives for each lesson are clearly stated. In addition, handout sheets are provided which may be duplicated by the teacher for use with the students. Ecological concepts are clearly explained with fine visual appeal.



BIOLOGY

Geography & Social Studies

GEOGRAPHY

Company: Atari Program Exchange

Language: BASIC

Hardware Requirements: 16K

Department: Education

Sugg. Retail: \$29.95

Availability: 9

Disk or Tape: Disk

OVERALL RATING	A	EASE OF USE	A	ERROR HANDLING	A-
EDUCATIONAL VALUE	A	DOCUMENTATION	A	RELIABILITY	A
VENDOR SUPPORT	C	VISUAL APPEAL	B	VALUE FOR MONEY	A

Memorization of the capitals of countries and states can be boring and tedious, but *Geography* makes it enjoyable. This comprehensive world geography program for grades four through ten includes drill and practice programs divided into four sections.

A) States—Geographic representations of a particular region of the United States appear on the screen with the state in question identified by an x. The student chooses the region as well as the number of questions. This section is for grades five through eight.

B) Capitals—The fourth through eighth grade student can request the state and identify the capital or vice versa or both. He may select a region or the entire United States.

C) Continents—Given the name of a country, the student must decide on which continent it is located. A list of continents appears on the screen with a number beside them. Enter the number of the continent to tell where the country is located. This section is appropriate for the fourth through eighth grade student.

D) Countries—Drill and practice is given on the capitals of the nations of the world. A choice is given as to working with capitals from any country or those from a specific geographic location. If the student answers incorrectly the first time, a hint is given relating the first letter of the capital. This section is appropriate for the seventh through tenth grader.

All four sections provide two chances to answer correctly before the computer produces the correct answer. Only the first two sections include geographic representations. A suggestion would be to include maps in the other two sections for reinforcement purposes. Also, the practice section on continents should require spelling of the continent as well. All four sections allow the student to choose the number of problems he desires to do. The scores are tallied at the end of each section. Just as with other APX programs, the documentation is well-done. Support materials, including handouts, suggestions for other activities related to the geography sections, and sample runs of the lessons provide a thorough package well worth the price.

ATLAS OF CANADA

Company: APX/Atari Program Exchange

Language: Atari Basic

Hardware Requirements: 16K cassette, 32K disk.

Department: Education

Sugg. Retail: \$24.95

Availability: 8

Disk or Tape: Both

OVERALL RATING	C	EASE OF USE	B	ERROR HANDLING	A
EDUCATIONAL VALUE	C	DOCUMENTATION	C	RELIABILITY	A
VENDOR SUPPORT	C	VISUAL APPEAL	C	VALUE FOR MONEY	C

Atlas of Canada is a geography program for the student who is studying the provinces, cities, and various topographical points of interest of Canada. The user is required to identify the position outlined on the map, such as provinces, capitals, lakes, islands, bays, rivers, and so on. Each time the program is run, a different order of positions is presented.

Atlas of Canada would have been an excellent program had the author expanded it with handouts, and included these in the documentation. The program, as is, is just too limited, and could have been much improved by offering more explanations, better graphics, and a variety of tests.

EUROPEAN COUNTRIES & CAPITALS

Company: Atari, Inc.

Language: Atari BASIC

Hardware Requirements: 16K, cassette player

Department: Education

Sugg. Retail: \$14.95

Availability: 9

Disk or Tape: Tape

OVERALL RATING **B**
EDUCATIONAL VALUE **B**
VENDOR SUPPORT **B+**

EASE OF USE **B**
DOCUMENTATION **A**
VISUAL APPEAL **B**

ERROR HANDLING **B**
RELIABILITY **B**
VALUE FOR MONEY **B**

Similar in approach to Atari's *States and Capitals*, this program displays 26 European countries and their capitals, at one a time, on an outline map of Europe. Not all European nations are displayed, and the student will search in vain for Liechtenstein, Andorra, and San Marino.

The student is asked to identify first the country, then its capital, which appears as a blinking dot. The program, however, suffers from the same shortcoming as the United States tutorial in that it evaluates only the first five letters of a response. Also, the program is often arbitrary in the answers it accepts. These programming quirks produce curious results. For instance, "Romania" is correct and "Rumania" is wrong; "Roma" is incorrect, but "Helsingfors," "Lisboa," and "Warsawa" are right. (So is "Lisbox" correct, counting only the first five letters.)

Despite these flaws, this program performs its task of familiarizing students with basic European geography in a pleasing and adequate manner.

FLAGS OF EUROPE

Company: Atari Program Exchange

Language: BASIC

Hardware Requirements: 40K; joystick optional

Department: Education

Sugg. Retail: \$24.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING **B-**
EDUCATIONAL VALUE **B**
VENDOR SUPPORT **C**

EASE OF USE **B**
DOCUMENTATION **B**
VISUAL APPEAL **A**

ERROR HANDLING **B**
RELIABILITY **B**
VALUE FOR MONEY **B-**

Teachers and students will find that *Flags of Europe* is an appropriate accompaniment to several other social studies and geography programs available through the Atari Program Exchange pertaining to European countries and their capitals. This two part program cycles first through 12 European flags, and then 14 European flags. The student has the choice of typing in the name of the country represented by the flag displayed or using a multiple choice answer format. I found that the "fill in the blank" format was more helpful following the multiple choice format. If answered correctly, a portion of that country's national anthem is played. If answered incorrectly, the student has a second chance in that the name of the country's capital is given as a clue. A running score of correct answers is kept in the lower lefthand corner of the screen.

The graphics are excellent, but I would like to see a small map in the corner of the screen highlighting in inverse video the country and its capital when the student selects the correct answer. This would help reinforce the learning process. The documentation could be improved if it included maps, handouts, and suggestions for the teacher.

STATES AND CAPITALS

Company: Atari, Inc.

Language: Atari BASIC

Hardware Requirements: 16K, cassette player.

Department: Education

Sugg. Retail: \$14.95

Availability: 9

Disk or Tape: Tape

OVERALL RATING **B**
EDUCATIONAL VALUE **B**
VENDOR SUPPORT **B+**

EASE OF USE **B**
DOCUMENTATION **A**
VISUAL APPEAL **B**

ERROR HANDLING **B**
RELIABILITY **B**
VALUE FOR MONEY **B**

Atari's *States and Capitals* is a graphic geography lesson suited to children aged 6 and up. An outline map of the continental United States is printed on the screen, and outlines of each state are added one by one in random order. (Alaska and Hawaii appear off the West coast when their turns come up.) The capital of each state, when requested, appears as a blinking dot. The student is then prompted first to name the state, then its capital, while the program determines if the response is correct or not, and prints the right answer on the screen. The student can give only one response to each question, but can correct potential misspellings by hitting the "Backspace" key. (Note: if he accidentally hits the adjacent "Break" key, the program terminates.)

The state being queried appears in white, while previous states remain on the screen in a different color to avoid confusion. Once begun, the program cycles through all 50 states unless terminated with the Break key. A running total of correct answers is continuously displayed. Unfortunately, the program evaluates only the first five letters of each response. Thus "North Moscow" would be a correct response for either North Dakota or North Carolina; and "New Yuck" will do for New York (though "New Muck" will not).

Side one of the tape contains audio instructions delivered with overblown hype. Side two contains the program itself. The audio instructions are really unnecessary, since the printed instructions are comprehensive, and even include a set of screen displays.

Despite its flaws, *States and Capitals* offers a quick and painless way to learn simple U.S. geography, and will no doubt prove entertaining to its young users.

GLOBE MASTER

Company: Versa Computing
Language: Basic
Hardware Requirements: 32K

Department: Education
Sugg. Retail: \$29.95
Availability: 4
Disk or Tape: Disk

OVERALL RATING **B+**
 EDUCATIONAL VALUE **B+**
 VENDOR SUPPORT **B**

EASE OF USE **A**
 DOCUMENTATION **C**
 VISUAL APPEAL **A-**

ERROR HANDLING **B+**
 RELIABILITY **B+**
 VALUE FOR MONEY **B+**

Globe Master uses high resolution color maps to drill and test a student's knowledge of world geography. This educational package consists of nine separate lessons on two disks. These lessons cover specific continents, large countries like the United States and Canada, and two cover world geography.

The lessons present highly detailed maps of particular areas of the globe. The student has a choice of identifying countries, states, capital cities, and bodies of water, using either the full spelling, or just the first letter of the name of each. The single letter is for beginners and can lead to some lucky guesses. I typed an "S" to identify what I thought were the Solomon Islands only to discover that the small blinking dot was actually pointing to Somoa. The program counted the answer as correct. Incorrect identifications are repeated later until the student gets them right. The final score indicates the number of attempts made to correctly identify all of the locations on the map. Scores can be improved by answering bonus questions about the local mountains and bodies of water.

It is difficult to locate the small blinking cursor on some maps where there is very small detail. This is true of Europe (especially the Benelux countries), the New England states on the map of the U.S., and on portions of the world map. Even the pixel-sized cursor at times becomes lost in the details.

Globe Master is a very comprehensive package for the geography class. Its lessons cover the entire world in sections, and drill the student either on a country's name or its capital. The maps are excellent. Versa offers a better buy than either of the two Atari-brand geography packages on the market.

THE MARKET PLACE

Company: Atari Program Exchange
Language: BASIC
Hardware Requirements: 16K

Department: Education
Sugg. Retail: \$29.95
Availability: 9
Disk or Tape: Disk

OVERALL RATING **C-**
 EDUCATIONAL VALUE **C+**
 VENDOR SUPPORT **B+**

EASE OF USE **C**
 DOCUMENTATION **B**
 VISUAL APPEAL **B-**

ERROR HANDLING **D-**
 RELIABILITY **C**
 VALUE FOR MONEY **C**

If design were the only important consideration in software, *The Market Place* would receive high marks. Structured as a teaching aid for schoolchildren in grades 3 through 8, the program's documentation includes handouts and worksheets to strengthen a student's understanding of economics. Good intentions do not, however, compensate for faulty execution. *The Market Place* has serious problems in two of its four simulations. The disk itself loads slowly and noisily, frequently crashes, and requires a power down and cold start.

The first scenario presents a store where students sell apples. The computer randomly selects an optimum price

which will maximize profits. By selecting various prices and noting the number of apples sold in each instance, the student determines the optimum price. The program suggests this can be done with five guesses. Since the price changes, a great deal of variety is possible (something not true of the three other models which use fixed prices).

Fruits give way to plants in the second model with participants now required to determine the effect of advertising. Advertising signs (costing "x" amount) will increase sales to a certain point; the object is to determine the point at which additional signs do not generate enough revenue to cover the expense of advertising. Direct cause and effect is difficult to calculate since participants must also guess the most profitable selling price, and the exercise will be pointless if that initial price is too high.

"Lemonade Stand" incorporates supply and demand with pricing and advertising. Participants now decide how many glasses of lemonade to make on each of 15 days. Once again, advertising will improve sales assuming the students select the optimum price. The fixed cost of a glass of lemonade rises as the days pass (parents no longer agree to provide free sugar, etc.), and sales will be affected by random elements such as storms, heat waves, and street construction. With so many variables, it is not likely an elementary school class will come close to making the right price decision on the first or second try. The scenario frequently crashes and must be restarted from the beginning—not too practical for a teacher with a room full of agitated children.

The fourth model, "Bicycle Store," is unplayable for several reasons. Two teams take control of two bicycle stores. Each team is responsible for manufacturing, selling, and advertising its wares. Sales are determined by price, availability, and competitive pricing with the other shop. Thus, the shop with the best money management will sell the most bicycles.

I own a small business but I could not produce a consistent profit in this simulation to save my life. I doubt if junior high school students would get anything but frustration out of this program. Even worse, the program contains a major glitch. During a labor strike which, according to instructions, *halts* the production of cycles, great numbers of bicycles inexplicably appear in each store, plunging them into debt and destroying any hope of finishing the game.

The educational concept behind this package is a good one, but the program needs more work before it becomes a profitable instructional tool.

PRESIDENTS OF THE U.S.

Company: APX/Atari Program Exchange

Language: Atari BASIC

Hardware Requirements: 24K cassette; 32K disk

Department: Education

Sugg. Retail: \$17.95

Availability: 8

Disk or Tape: Both

OVERALL RATING **A**
EDUCATIONAL VALUE **A**
VENDOR SUPPORT **C**

EASE OF USE **A**
DOCUMENTATION **A**
VISUAL APPEAL **B**

ERROR HANDLING **A**
RELIABILITY **A**
VALUE FOR MONEY **A**

This is a nice, clean program that does just what it claims, with no frills or fuss. The student is prompted with four clues (dates of office, order of succession, one significant event in the life, and political party), and asked to identify from these the president concerned. On the easier level, the program displays a selection of four names, such as George III, John Calhoun, and Jefferson Davis. On the more difficult level, no names are given, and the student must type in the correct name, correctly spelled. The program cycles through all 40 presidents (Cleveland comes to bat twice), keeping visible score throughout. Partial credit is given for guessing the last name, and additional credit for guessing the correct first initial. The program is somewhat arbitrary about middle initials and middle names: Chester Alan Arthur is correct, but Dwight David Eisenhower and Lyndon Baines Johnson are wrong. Middle initials usually pass, with the surprising exception of Franklin Roosevelt's "D." Each question allows only one response before awarding points and passing on. The student may restart the program without completing the cycle.

One may quibble with the choice of clues. A second significant fact about each president would probably have been of more interest, and of greater pedagogical value than his order in the succession. Moreover, the author of the program is kinder to some presidents than to others: Richard Nixon's "significant event" is the lunar landing; Jimmy Carter's is the Iranian crisis. Since this program is unprotected (as all educational programs *should be*, and most are not), an aspiring young programmer can easily change the applicable lines to read "barely escaped impeachment" in the first case, to "Camp David agreements" in the second. Depending upon the student's ingenuity, he can substitute interesting facts about any president he wishes.

I can recommend this program, finally, for its high educational value, its ease of use, and its accessibility.

Typing Programs

HI-RES MASTERTYPE

Company: Lightning Software
Language: BASIC
Hardware Requirements: 32K,

Department: Education
Sugg. Retail: \$39.95
Availability: 6
Disk or Tape: Disk

OVERALL RATING A -
EDUCATIONAL VALUE A -
VENDOR SUPPORT A -

EASE OF USE A -
DOCUMENTATION A -
VISUAL APPEAL B

ERROR HANDLING A -
RELIABILITY A -
VALUE FOR MONEY C -

MasterType is yet another progressive typing program, but with a difference. It incorporates an Invader type game as it presents opportunities to practice typing skills.

The typist is in command of the space ship at center screen. In the four corners of the screen appear letters, words, numbers, and/or other combinations that the typist must quickly enter, in order to prevent their slow, but constant movement towards the ship, resulting in a collision that will produce damage. The collisions and/or the successful typing of one of the "enemy" phrases is rewarded with sound and color displays. There is a sequence of 10 such trials before a message appears to report both on the status of the ship and the speed of the typist in words per minute.

The diskette provides 17 lessons. Lesson #1 starts with the letters ASDFGHJKL, and presents each letter in this home row as an "enemy" word. Lesson #2 presents two or three letter words of that row. Lesson #3 uses three, four, or five letter words of the same row. Lesson #4 moves to the third row, with the letters, QWERTYUIOP. Lesson #5 provides short words using the home and third rows together, and so on up to lesson #17, which gives practice with difficult numbers and symbols. There is a MAKE LESSON on the diskette which allows the user to create lessons. They can be saved on the program diskette (never a wise option), or on a pre-initialized, 13-sector diskette.

Although the instructions specify that, in any mode other than Beginner, the typist should press (SPACE) to show completion of input, it is actually more desirable to press (RETURN). Another suggestion in the manual states that to correct mistakes in typing, "press the space bar and try again. You will be penalized a few points for making a mistake, but you should have enough time to type the word again." It then states, "another way to correct your mistakes is to use the left-arrow key to backspace over your mistake and retype it." In a word-processing environment, the power of the computer is to simplify corrections. The use of the backspace to correct errors is to be encouraged, not avoided!

The advertising for this package implies that this form of play-teaching is effective, if not addictive. This reviewer has seen exactly such events take place — with a typing teacher and with students.

The price is somewhat high for this package. If that is not a major consideration, *MasterType* is highly recommended.

TYPO ATTACK

Company: Atari Program Exchange
Language: Machine
Hardware Requirements: 810, 16K

Department: Education
Sugg. Retail: \$29.95
Availability: 9
Disk or Tape: Disk

OVERALL RATING B
EDUCATIONAL VALUE C+
VENDOR SUPPORT C

EASE OF USE B
DOCUMENTATION B
VISUAL APPEAL B

ERROR HANDLING A
RELIABILITY A
VALUE FOR MONEY B

Typo Attack resembles an arcade game. In fact, it reminds me of *Space Invaders*. You type the characters beneath eight bases subject to bombardment from falling typos; the typos fall faster as you move to a new wave. If you fail to fire the energy bolt, the typo hits the ground and digs toward your base. If one makes it all the way through the buffer zone protecting your base, an explosion ends the game.

This is a typing program? Yes, and while you madly hit at the keys, you become aware of their position on the keyboard. Unfortunately, the game does not give the novice a very good orientation to the keyboard. Home keys a, s, d, f, and j, k, l, and ; should be used longer before starting on other keys. However, the author does not claim to be teaching you typing. You may want to choose a typing tutorial first and reward yourself for endurance with *Typo Attack*. It offers nine skill levels, and presents a scoreboard display before each new wave appears.

TOUCH TYPING

Company: Atari

Language: Atari Basic

Hardware Requirements: 16K

Department: Education

Sugg. Retail: \$24.95

Availability: 9

Disk or Tape: Tape

OVERALL RATING **B**
EASE OF USE **B+**
VENDOR SUPPORT **B+**

DOCUMENTATION **B+**
VALUE FOR MONEY **C+**
VISUAL APPEAL **C**

RELIABILITY **B-**
ERROR HANDLING **B**

Typing is one of those subjects far more boring to teach than to study, and seems an ideal subject for the individual tutorial possible with a home computer. Of course, since you are loading the program through the Atari keyboard, used as your practice typewriter, you must at least be able to hunt-and-peck enough to get started. Once *Touch Typing* is loaded (and you must be patient, as it takes several minutes to "boot up" each cassette), the program offers a series of exercises that will take you from beginning through advanced typing levels. How quickly you learn typing accuracy, rhythm, and speed is determined by the rate at which you master the practice routines. The program isn't on a schedule or timed in any way, except that as you progress it will calculate the Words-Per-Minute rate at which you type (from 10 up to 80 wpm).

Finger drill is the program's main thrust, moving eventually to duplicating test paragraphs. To start, the keyboard is displayed on-screen, divided for lefthand and righthand practice. A set of keys is designated for practice, and you are asked to duplicate a pattern following those letters displayed beneath the keyboard, then go on to the next drill. You cannot "correct" yourself by backspacing and typing over letters, because the program tracks these and lets you know your error and wpm rates. I found it rather annoying that you could not repeat an exercise but only go on to the next. To repeat a drill you'd have to re-boot the whole program and start again. At more advanced levels, the program prompts you with a metronomic bleep on the keystroke to reinforce the proper wpm tempo (the wpm rate is adjustable). If gives you an error count, and it points out your worst mistakes, so you have at least three areas to improve as you advance.

The basic teaching method is sound, and *Touch Typing* is a good tool for learning a necessarily mechanical subject (after all, you cannot get far with computers if you cannot type). I wanted to see a much greater flexibility in moving around to different exercises, so that one could repeatedly practice in problem areas (a limitation of the cassette system, I suppose). There is no real provision to train you to keep your eyes on the page you're working from and not look at the keyboard; this would be hard to achieve, admittedly, but this facet of "touch" typing should be stressed more. I was also disappointed that more was not made of Atari's graphics capabilities: color could have been used to much greater effect to distinguish keys designated for drill, for example. But on the whole the program is simple to follow, and teaches the fundamentals of touch typing in a relatively short time.

TYPO

Company: Romax Inc.

Language: Machine

Hardware Requirements: 8K

Department: Education

Sugg. Retail: \$44.95

Availability: 4

Disk or Tape: Cartridge

OVERALL RATING **A**
EDUCATIONAL VALUE **A**
VENDOR SUPPORT **B**

EASE OF USE **A**
DOCUMENTATION **B**
VISUAL APPEAL **A**

ERROR HANDLING **A**
RELIABILITY **A**
VALUE FOR MONEY **B+**

If learning to type can ever be fun, *Typo* has done it. *Typo* is a one player touch typing game. The scenario is a maze littered with dots, with a window in the center of the screen where letters, words, or phrases appear. Select the speed that you want (or a little faster if you want to push yourself), push the start button, and type away.

As you type, a ship eats the dots in the maze. But beware, there is a yellow monster lurking near you, moving at the speed you selected for your words per minute (wpm). Typing faster than your prescribed wpm will keep your ship safely away from the monster. If the monster catches your ship, it will fall to the bottom of the screen. Your goal is to get all the dots without getting caught by the monster. *Typo* is entertaining and gives you plenty of motivation.

Typo has many options to choose from (like letters, words, or phrases). If you get bored with the pre-saved vocabulary, there is an option to enter your own which will be displayed randomly when you begin the game. Other features include a pause button and a help button which instructs you on entering different options.

Typo is well constructed, which makes it delightful to use. It has nice, articulate graphics, is very colorful, and plays music in the background. I would recommend this program to anyone who wants to have fun learning to type.

Computer Science

TRICKY TUTORIALS

Company: Educational Software, Inc.

Language: BASIC

Hardware Requirements: 16K, cassette; 24K disk.

Department: Education

Sugg. Retail: \$19.95 ea. (#5 \$29.95)

Availability: 5

Disk or Tape: Both

OVERALL RATING **B**
EDUCATIONAL VALUE **B+**
VENDOR SUPPORT **B-**

EASE OF USE **B**
DOCUMENTATION **B-**
VISUAL APPEAL **B-**

ERROR HANDLING **N/A**
RELIABILITY **B**
VALUE FOR MONEY **A**

Tricky Tutorials is a series of six programs that attempts to make the inner workings of Atari sound and graphics understandable. In many regards, these programs do a commendable job through their many working examples and explanations provided in the documentation. The friendly style sometimes isn't the clearest, but with a little bit of re-reading and some patience on your part the explanations will eventually become clear. Programs on the disk provide ready-to-use routines for the beginner.

There are six units: (1) Display Lists; (2) Horizontal/Vertical Scrolling; (3) Page Flipping; (4) Basics of Animation; (5) Player-Missile Graphics; and (6) Sound. Each is self-running, in that when one part of the lesson is finished, the user need only press the Option or Start key to load the next portion in automatically. Each did a thorough job of presenting useful information, and the following two programs are the most representative of those in the series.

Player-Missile Graphics — *Tricky Tutorial #5* is an excellent introduction to player-missile graphics for the BASIC programmer. Through the design and explanation of a simple arcade game, the reader begins to understand the concept of player-missile graphics. This concept is re-inforced by the use of small segments in simple examples. These examples show, for example, how the collision register can detect a collision with a particular playfield color (eating the dots in Pac Man), how animation alternates between two different player shapes, and what might happen if player data is put in the wrong place. There are a total of twenty-five different examples in 14 programs. Most of these are controlled by the student with joysticks.

There are also three simple utilities that hopefully will make designing playfields, player-missile shapes, and the choice of colors an easy task. None of these utilities is very sophisticated, but they are adequate. The player-missile editor is probably the most useful of the utilities. It is completely keyboard operated, and will save string data to the disk.

The documentation is good. The 50 pages discuss all aspects of player-missile graphics, and present many of the program listings on the disk. It is thorough and easier to understand than the brief explanation in the book *De Rey Atari*. In sum, this tutorial is one of the more instructive of the series. It makes a fairly difficult subject understandable.

Sound — *Tricky Tutorial #6* is a set of lessons to teach you all about the Atari's sound registers, and their capabilities for producing sound effects and music. This is an on-screen tutorial where each concept is actually demonstrated. After demonstrating what each of the registers does in the sound statement, it encourages the user to use the paddles to vary each register value. Thus it is very easy, for example, to discover the sounds of hyperwarping through space (as in the *Star Raiders* game). The program goes on to explain how to store noted and duration numbers as data statements, then proceeds with a discussion on how to construct a wait subroutine using the machine's internal clock. The actual BASIC code is shown on screen. There is no need to write this down as all listings are in the documentation. A practical music example is illustrated with the tune "Do-Re-Mi" from the *Sound of Music*. There is also an example of how to produce chords, and a demonstration of how the distortion register can make much deeper sounds just by adjusting pitch.

Some sound effect examples are also shown, both in code and in sound. These include a machine gun, telephone ringing, bomb falling followed by the customary explosion, and laser fire. Finally, there is a joystick-controlled sound editor that will easily allow you to change any of the values in three of the sound channels.

This tutorial is much better written than the five previous tutorials. It is self-running, user interactive, and instructive. It is a very easy and painless way to learn about the Atari's sound capabilities.

CHARACTER GRAPHICS TUTORIAL

Company: Educational Software

Language: BASIC

Hardware Requirements: 32K (disk); 16K (cassette)

Department: Education

Sugg. Retail: \$29.95

Availability: 6

Disk or Tape: Both

OVERALL RATING
EDUCATIONAL VALUE
VENDOR SUPPORT

C+
C
B

EASE OF USE
DOCUMENTATION
VISUAL APPEAL

B
B+
B

ERROR HANDLING
RELIABILITY
VALUE FOR MONEY

B+
B+
C

Character Graphics Tutorial is the eighth in a series of educational programs devoted to making Atari graphics understandable. This tutorial attempts to show the power and versatility of character graphics that use alternative character sets either for illustration or animation. These demonstrations include such things as horses galloping across the screen or character graphics animation presented in a very simple game. You will have to carefully study the accompanying program listings in order to get much out of the lessons. Also, the examples demonstrate possibilities but don't teach programming. The only program that could be considered an actual lesson is one that explains the structure of a byte and the values of the individual bits.

The package includes a very good character editor supporting both disk and cassette users. The character editor has the ability to edit either single characters or a two by two matrix of characters, and allows the user to animate a sequence of characters. Character set animation can be tested before it is ever incorporated into a program. The editor is user friendly, menu driven, and operated by simple cursor key movement. Characters chosen from a 128 character set are defined and edited on an oversized grid. There are options to bit shift the character pixels in any of four directions, to display the byte values beside any character for later use in the program, and to save entire character sets for later use. The data is stored in hexadecimal, but a USR function is provided to enter it into BASIC programs.

This tutorial is a better utility package than teaching tool. However, even the best of tutorials have limitations when covering such a complex subject as character set animation.

ASTEROID MINERS TUTORIAL

Company: MMG Micro Software

Language: BASIC

Hardware Requirements: 32K

Department: Education

Sugg. Retail: \$34.95

Availability: 3

Disk or Tape: Disk

OVERALL RATING
EDUCATIONAL VALUE
VENDOR SUPPORT

D
D+
C+

EASE OF USE
DOCUMENTATION
VISUAL APPEAL

C
C
D

ERROR HANDLING
RELIABILITY
VALUE FOR MONEY

N/A
B
D

Asteroid Miners Tutorial, a game written in BASIC with several machine language subroutines, includes an extensive explanation of how the program works. The listings of the entire game and the machine language subroutines are included with a fifteen page tutorial.

During the game you move a joystick controlled spaceship around an asteroid field, selecting certain colored asteroids to mine. This is not an exciting or interesting game. It is the type found in many magazine articles, and is instructive in the sense that it uses a redefined character set for the asteroids, three players to make up the ship, a vertical blank player move routine, and a complex machine language timing routine whose accuracy is totally unnecessary for a simplistic BASIC game.

While the explanation of the game code is more extensive than the sort you'll find in the longest of the magazine articles, it is lacking in some respects. First, a tutorial should include a flow chart of the game's operation. The beginners who purchase these tutorials don't understand the flow of even the simplest games. Reading commented game code is not the answer. Second, it is unfortunate that an example using missiles wasn't included. Articles have always neglected supplying missile move subroutines because of the complexity of masking bits controlled by the remaining missiles. Finally, as to my objection to using a complicated machine language timer, a slightly less accurate timer is available directly from locations 18, 19, and 20. These can be easily PEEKed and POKed while they are being incremented every sixtieth of a second.

In the final analysis, the question is whether the package is worth the money. The tutorial is a definite help, but not much more than what can be obtained from *Compute Magazine's* "First Book of Atari Graphics" at half the price. If you are buying the package for the game itself, don't. If you are considering it for the tutorial, it is priced a bit high, but not totally out of line with current software prices.

AN INVITATION TO PROGRAMMING #2

Company: Atari, Inc.

Language: Atari Basic

Hardware Requirements: 8K, cassette player.

Department: Education

Sugg. Retail: \$29.95

Availability: 9

Disk or Tape: Tape

OVERALL RATING **A**
EDUCATIONAL VALUE **A**
VENDOR SUPPORT **B+**

EASE OF USE **A**
DOCUMENTATION **B+**
VISUAL APPEAL **A**

ERROR HANDLING **B+**
RELIABILITY **A**
VALUE FOR MONEY **A**

The developers of *An Invitation to Programming* have that rare ability to make learning entertaining and painless. A two-part programmed lesson, divided into "Writing Programs One" and Two," goes step by step from beginning BASIC into advanced programming techniques.

The package contains two cassettes and a workbook manual. Each lesson is loaded into the computer from cassette following very explicit instructions in the manual. This should not present a problem, even to a beginner. Each lesson initially makes good use of sound and graphics, giving an idea of the capabilities of programming in BASIC as well as providing motivation to continue with the lesson.

Each cassette includes a complete unit of instruction. The first, "Writing Programs One," provides seven lessons, beginning with an explanation of, and experimentation with the keyboard. The student is then taken through the six lessons that follow, learning about and working with commands, variables (including string variables), and computer logic with IF/THEN, GOTO, and FOR/NEXT loops. There is an excellent quiz at the end of each cassette which should give the student an idea of how well the lesson has been understood. The second part, "Writing Programs Two," provides eight lessons, beginning with screen formatting instructions. This program then goes on to cover READ/DATA, arrays, some interesting aspects of PEEK and POKE, ATASCII, string handling, multiple statements, and then finishes up with subroutines.

These two programs give the beginner a very good foundation from which to continue the study of BASIC. The only major flaws in this excellent program are those inherent in the use of the cassette recorder. Loading problems can be very frustrating. Having both the programmed screen lesson and the audio instructions on the same tape requires keeping track of the tape counter in order to know where the audio portion begins. In the event the student is interrupted, or would like to review a lesson, it is difficult to coordinate the audio with the screen action short of going back to the beginning of that particular lesson. These programs make good joint use of screen and manual. The lessons on the screen refer to "frames" in the workbook for further information, and also for extensive, well-developed practice sessions.

An Invitation to Programming #2 is best used by individuals who like to work at their own speed, and tend to acquire a thorough understanding of each subject before going on to the next. It can also be adapted to classroom use by an imaginative instructor, who could apply it as an individual student tutorial, or an entire class lesson.

Though one might argue with the order in which topics are introduced in the lessons, or the particular subjects chosen for emphasis, it is difficult to find fault with the overall program. This package is a very well-presented, enjoyable set of lessons which will be a valuable asset to either the individual student or classroom instructor.

AN INVITATION TO PROGRAMMING #3

Company: Atari, Inc.

Language: Atari Basic

Hardware Requirements: 8K, cassette player.

Department: Education

Sugg. Retail: \$29.95

Availability: 9

Disk or Tape: Tape

OVERALL RATING **A-**
EDUCATIONAL VALUE **A-**
VENDOR SUPPORT **B+**

EASE OF USE **A-**
DOCUMENTATION **B+**
VISUAL APPEAL **B+**

ERROR HANDLING **B+**
RELIABILITY **A**
VALUE FOR MONEY **A-**

This is a two-part lesson divided into "An Introduction to Sound" and "An Introduction to Graphics." Budding young composers or artists, as well as teachers of art and music, will particularly enjoy working through these programs. Potential game programmers can also get a good look at the Atari's capabilities in sound and graphics.

The first cassette, "An Introduction to Sound," covers in seven lessons, sound registers, sound effects, sound routines, sound programs, musical ABC's, identifying notes, and sound routines with multiple registers. There is an excellent quiz at the end of each cassette which should give the student an idea of how well the lesson has been understood. The second part, "An Introduction to Graphics," also covers seven lessons (from a graphics demonstration to character graphics).

This is an excellent program with minor flaws (for which I refer the reader to the review of *An Invitation to Programming #2*). The manual, with its tables on musical notes, color registers, graphics modes, and keyboard

diagrams, stands as a good reference source by itself.

The program, finally, is best used as a self-tutorial on an individual basis. However, a creative instructor should have little difficulty adapting it to classroom use.

TURTLE TRACKS

Company: Scholastic Software

Language: Atari BASIC

Hardware Requirements: 32K

Department: Education

Sugg. Retail: \$34.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING **B**
EDUCATIONAL VALUE **B+**
VENDOR SUPPORT **B**

EASE OF USE **B**
DOCUMENTATION **A**
VISUAL APPEAL **C**

ERROR HANDLING **A-**
RELIABILITY **B+**
VALUE FOR MONEY **B**

Turtle Tracks teaches fundamental data processing concepts. While it targets a school-age audience, I think that adults who want to familiarize themselves with the way a computer functions will find the program of immense value.

As its name suggests, *Turtle Tracks* introduces you to yet another turtle, but one who doesn't speak either PILOT or LOGO. The program's ten lessons teach you the strange dialect the turtle speaks. Compared to PILOT or LOGO, this turtle has a very limited vocabulary. It can "draw forward" (leaving a trail) or "jump forward" (without a trail). It can also turn right or left. In giving the turtle instructions, you can use a maximum of two variables and three nested loops. You can write and save subroutines to include in the program, and you can combine programs easily. *Turtle Tracks* gives you moderate flexibility in choosing colors and sound, letting you choose either Graphics Mode Zero or Graphics Mode One.

The main program is large (115 sectors) and written in BASIC. While I found it slow in digesting its turtle commands, turtles are not known for their speed. On the other hand, the documentation is excellent. It assumes that you bought your Atari computer yesterday and walks you through the turtle's paces simply and without condescension. The manual includes a glossary, a compendium of common "turtle mistakes," and answers to the quizzes at the end of each of the ten lessons.

If you're interested in learning the fundamentals of computing without delving into one of the heavier languages, *Turtle Tracks* will suit you just fine.

MEMORY MAP TUTORIAL

Company: Educational Software

Language: BASIC

Hardware Requirements: 32K

Department: Education

Sugg. Retail: \$19.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING **A**
EDUCATIONAL VALUE **A**
VENDOR SUPPORT **B**

EASE OF USE **A**
DOCUMENTATION **B+**
VISUAL APPEAL **B+**

ERROR HANDLING **B**
RELIABILITY **A**
VALUE FOR MONEY **A**

The Memory Map Tutorial is a series of 34 short programs that show BASIC programmers how to modify Operating System memory locations. The interactive approach used by the tutorial is both clever and interesting. For example, the tutorial takes a series of POKES controlling the left and right margins of the text screen and allows you to adjust them via the arrow keys. Other examples indicate the effect of holding values stationary in a four line text screen, how to determine which kind of letters are being input by an input statement, how to defeat the attract mode, and how to use the console keys. Other examples deal with tab stops, the Real-Time clock, the inverse flag, saving an error in a TRAP statement, and creating an invisible cursor. Also included in the package is a demonstration on testing both paddles and joysticks, and one that explains what the value of a byte is by turning on individual bits.

The programs are all documented and explained in a 27 page permanent reference booklet. Each of the programs can be accessed separately, or they will appear in the order you specify. This is helpful if you are learning your lessons over a period of several days. All things considered, this tutorial offers an excellent teaching value to programmers who want to learn more than the standard BASIC commands.

TRICKY TUTORIAL #9—GTIA Graphics

Company: Educational Software

Language: BASIC

Hardware Requirements: 32K

Department: Education

Sugg. Retail: \$29.95

Availability: 4

Disk or Tape: Both

OVERALL RATING **C**
EDUCATIONAL VALUE **C-**
VENDOR SUPPORT **B**

EASE OF USE **B**
DOCUMENTATION **B-**
VISUAL APPEAL **B**

ERROR HANDLING **B**
RELIABILITY **B**
VALUE FOR MONEY **C-**

GTIA Graphics makes the ninth in a series of tutorials from Educational Software which vary widely in educational quality. Unfortunately, this is one of the weaker programs. It covers the three extra graphics modes available in computers with the GTIA graphics chip. These three modes allow first, sixteen different luminances in one hue, second, sixteen different hues with one luminance, and third, nine different hues with one luminance. The first two do not take advantage of Atari's indirect color register; instead, the color is bit-mapped on the screen. You use these modes mainly to create detailed pictures with heavy shading, or very colorful pictures.

The package also includes a drawing program for GTIA Mode 10, the nine-color mode. It allows you to plot colored, elongated GTIA pixels on the screen using a joystick-controlled cursor. You can save finished drawings to disk. The accompanying booklet helps only if you have not read up on the subject; if you have, the program in toto merely shows the potential of the graphics modes.

TRICKY TUTORIAL #10—SOUND EFFECTS

Company: Educational Software

Language: BASIC

Hardware Requirements: 32K

Department: Education

Sugg. Retail: \$29.95

Availability: 4

Disk or Tape: Disk

OVERALL RATING **C**
EDUCATIONAL VALUE **C**
VENDOR SUPPORT **B-**

EASE OF USE **B**
DOCUMENTATION **C**
VISUAL APPEAL **C**

ERROR HANDLING **B**
RELIABILITY **B+**
VALUE FOR MONEY **C-**

Tricky Tutorial #10—Sound Effects does more to demonstrate how sound effects can enhance a BASIC program than to actually teach you how to create sound effects. Because sound effects are produced largely by experimental means, they don't lend themselves to a structured, tutorial approach.

The heart of the tutorial is a selection of thirty-six sound effects. These include a telephone, thunder, a racing car, a locomotive, a buzzer, rain, ping-pong, and a horse neighing, among others. Many of the sounds are not accurately represented by the names given to them on the menu selection. In fact, you could make a game of trying to identify the various sounds. Having heard better versions of many of these same effects in other game programs, I question how much time the author actually spent in polishing the program. Perhaps the real value here is that each sound provides the listable line numbers that it refers to. The line numbers can then be studied and modified.

Since many sound effects can be achieved by varying the pitch while lowering the volume in a nested FOR-NEXT loop, the author has thoughtfully provided a joystick-controlled program in which you can adjust the parameters, then listen to the result. This enables you to adjust both the range and the step-size of the two loops.

The tutorial also demonstrates the advantages of working directly with the sound registers rather than BASIC's SOUND statement. You can get a greater range of pitch by combining two sound channels into a 16-bit register. Also, the little joystick demo lets you change the values of the two sound registers to hear the effect when both are "paired" for 16 bit sound.

I wouldn't say that the documentation gives a full explanation, but it is sufficient to get most programmers started. It contains helpful listings of all of the sound effect examples.

Miscellaneous Education

DORSETT EDUCATIONAL SERIES

Company: Dorsett Educational Systems

Language: BASIC

Hardware Requirements: 16K

Department: Education

Sugg. Retail: \$59.90 per 8 cassette set

Availability: 6

Disk or Tape: Tape

OVERALL RATING
EDUCATIONAL VALUE
VENDOR SUPPORT

A-/D
A-/D
B

EASE OF USE
DOCUMENTATION
VISUAL APPEAL

A
N/A
C-/F

ERROR HANDLING
RELIABILITY
VALUE FOR MONEY

A
B
C

Dorsett Educational Systems markets a wide selection of educational programs for ages ranging from the six year old to the adult. The student can practice with elementary vocabulary lessons, learn basic fractions, take an accounting course, or review the classics. Dorsett offers fifty-two complete series, and, with eight double-sided cassettes per set, this amounts to 832 individual programs. Such an impressive number of programs is bound to vary widely in quality and educational value. Thus, the above ratings represent an average, and while time and space would not permit us to review each individual program, we hope the reviews which follow will provide a representative sampling of the series.

All courses utilize the Educational System Master Cartridge, developed by Dorsett and at one time marketed through Atari. The cartridge is currently available only through Dorsett at a cost of \$25.00, and is required to run the programs. Each Dorsett cassette series consists of 8 double-sided cassettes covering 16 programs at a total cost of \$59.90. A tape can be purchased individually for examination, and a \$79.00 package including documentation, tests, and a fancy binder is also available. If you are not satisfied with your software, Dorsett has an exchange policy, not a return policy. They will allow a ten day, 100% exchange.

All of the programs offer only minimal interaction with the computer and very limited use of graphics. The Atari sound generators are not used at all. Dorsett is best known for its audio-visual educational and industrial material, and these programs are more akin to recorded lectures. We expect interesting and exciting programs from the computer, but they have done little that a slide projector and cassette recorder wouldn't have done just as well. Indeed, the programs appear to have been transferred directly from Dorsett's M-99S, an automatic 35mm sound/filmstrip projector, with crude graphics added in the form of punctuation marks.

The student selects from the number keys 1, 2, or 3 in response to a multiple choice question on the material just covered. The method of selecting a correct answer never varies, and only multiple choice answers are available. The correct answer causes the tape to continue; incorrect answers result in a buzz from the internal speaker until the correct answer key is pressed, and then the tape continues. The tapes are all oral and the buzz is disruptive. There is no provision whatsoever for branching to a special help routine after an incorrect answer. Nor is there reinforcement for problem areas, and the only response to a correct answer is a spoken "yes" or "good." There is no summary of correct or incorrect responses; no provision to replay a student's problem areas; no reinforcement for a job well done. When the tape is finished, it ends.

The material itself is presented in a fair degree of depth. The announcer reads his lectures slowly when covering simple material, but has an annoying tendency to speed up when the material is more complex. The tone of his delivery as well as the programs themselves is decidedly schoolish.

These tapes provide drill and practice. They do not require any teacher involvement once the pupil has been introduced to the manner of loading the tape. It is important to remember that the lessons are condensed versions of the subject area. Therefore, the student should not use the tapes in place of, but in addition to, the textbook; nor should they be used as a substitute for in-class instruction.

If there is one primary fault to the Dorsett series it is the failure to use the computer as an interactive tool. The potential for excellent educational programs is unlimited, and unfortunately Dorsett has failed to capitalize on the capabilities of the Atari. Instead, the series presents the student with a passive experience that is not as sensually rich as a film, nor as flexible as a book.

Accounting

Principles of Accounting covers basic accounting terminology and presents concepts which include assets, journal and ledger, balance sheet and income statement, accrual accounting in retail firms, business accounts, cash and payroll, inventory, fixed assets, partnerships, and corporate year-end accounting. Obviously, a great deal of information is being covered here; however, the explanation is lucid and the terminology well-defined. For example, a confusing concept that is clearly explained is debit/credit—debit meaning the left side of the account, not a debt. Credit refers to the right side of the account. To debit cash refers to receiving cash and debiting it to the account. To credit the account means to credit cash when we pay cash.

The lessons commence with the basic accounting fundamentals such as assets, liabilities, and equity. Situations are created whereby the user must choose the correct transaction, demanding a more thorough knowledge of the lesson's application. The graphics here are a real aid in understanding the transaction process.

Algebra

The lessons on *Algebra* seem to be better prepared than other cassettes in the Dorsett mathematics series. This series would best be used as an introduction to algebra, as it is not comprehensive enough to be considered a course in itself. While the subject matter does jump around within each lesson, the overall presentation is good. The illustrations are clever but outdated; with the capability of Atari graphics, much more is to be expected. The lessons themselves contain some grave errors. For example, 2, 4, 6, 8 is offered as the set of even integers when it should be a set of even integers. The same is true of a set of primes offered to the student as a choice.

Factoring is one of the better lessons in the series, but could benefit from the use of more examples as it is a very difficult area for most students. The subject of graphing or plotting points has been all but ignored. The series incorporates some unusual terms; for example, the union and intersection symbols are referred to as "cap" and "cup." This is not standard textbook reference.

Algebra, finally, will provide a very helpful overview for the student either at home or in a classroom situation.

Decimals and Percents

Decimals and Percents begins with a standard lesson on decimal and fractional equivalents. The repetition of the same type of problems after a concept has been explored is a little overdone. The lessons on place value, addition, subtraction, and multiplication are adequate. Lesson 5, titled "Changing Fractions to Decimals," seems to be misnamed, dealing, as it does, with the division of decimals. The lesson on changing percentages to decimal equivalents has more to do with fractions than with decimals. Those lessons on rounding, part, percent, and total are the usual lessons found on the subjects, as is solving for the missing percent. However, errors in the problems displayed on the screen tend to distract the more experienced student and mislead the inexperienced.

One of the problems with this series involves the format of question and answer. The student must select the correct answer out of only three choices. Unfortunately, the selections do not require the student to give much thought to the answer. The process of elimination is far too obvious in many instances. For instance, 31 and 31,000 are given as possible answers to one problem.

The age level recommended by Dorsett is 5 to 12. While the beginning lessons could be used by an elementary school, the later lessons on interest and installment buying are far too advanced for junior high. The only practical way to circumvent this problem is to order the lessons individually, which is far more costly.

Geometry

The *Geometry* series is suggested for age levels 6-12, but the lower end of this age group is a more suitable range. The lessons review the size and shape of simple polygons, the triangle, rectangle, square, and circle. In dealing with these shapes and the formula for area and perimeter, the program does a reasonable job. The illustrations, particularly of the square and rectangle, are good; the triangles and circles are a little distorted. Apparently no one has told the folks at Dorsett that Atari has a graphics keyboard, as they have not made use of it.

There is nothing on postulates, theorems, or proofs here. Also, a lesson appears to be missing from the series because it jumps directly from the "Radius and Diameter of Circles" to "Volume of Cylinders and Prisms," without covering the circumference and area of the circle. The lesson on this subject seems to have been misplaced in the series on *Fractions*.

As in other mathematics lessons from Dorsett the repetition is boring, and numerous errors detract from the instruction. An example of this is found in lesson 13 called "Length, Width, and Area of Rectangles." The question on the screen is: Area = 33 sq. mi., Length = 7 mi., $W = ?$. The choices are: (1) 11 yds., (2) 3 yds., (3) 22 yds. Number 2 was accepted as the correct answer, but obviously the length was intended to be 11 yards and 33 square miles should have been square yards. There are other misleading entries. For instance, the program presents a choice between right and isosceles triangles that appears to disregard the fact that a right triangle can be an isosceles.

In conclusion, this series could provide a useful review of the basics for area and perimeter, but it has little value for teaching Geometry.

Great Classics

Great Classics provides a marvelous overview of such great literary classics as *Julius Caesar*, *Don Quixote*, *Macbeth*, and *Moby Dick*, to name a few. By condensing the plot through a storyline narrative, the tapes touch upon character, action, historical setting, symbolism, and genre. The speaker narrates a portion of the storyline which the student can follow on screen. After a few minutes of narration, questions are asked about the significant events and topics covered in the narration.

The tapes could provide a good introduction to the classics, and could be used as a basis to generate class discussions. They are also an excellent form of review in terms of plot, character, and action.

Mathematics for Electronics

This program is one of the better ones in the Dorsett series. If a person were planning to take an electronics course leading to an A.S. or its equivalent, and needed a math refresher, this course might do the trick.

The program covers the mathematics needed for electronics quite thoroughly. Topics covered include basic arithmetic with fractions, using slide rules and calculators, algebra and trig functions, simultaneous equations and vectors, and approximate values in practical applications. The modules are thorough, comprehensive, and valuable for a review of the subject.

Numbers

This comprehensive math program not only includes your typical mathematical drills but presents Greek and Roman numbering as well. Working at his own pace, the student may advance from simple addition to angles, triangles, fractions and parts of fractions. The multiple choice format does provide for variety in the style of questions; however, inputting the numbers would be more meaningful and advantageous to the learner. In Lesson One, this approach becomes confusing because multiple choice is simply not an appropriate structure for learning this kind of material. Depressing key number 1, 2, or 3, for left, middle, or right answer respectively, interferes with the naming of the numerals. The authors suggest color labels for the keys and corresponding labels below the screen. This program would be useful for first through fifth graders.

Physics

The Dorsett *Physics* course exemplifies one of the major weaknesses of the Dorsett system: the inability to limit and focus on the subject matter in manageably small segments. In attempting to cover a very complex and broad subject in four hours of lecture and text, it alternately bores and confuses. Not as detailed as a college physics course, yet too broad to fit a typical high school curriculum, it is difficult to determine where a course like this might fit.

Certain topics, such as mass and motion, are covered in a slow, simplistic fashion; whereas historical experiments are described very rapidly, using confusing graphics that leave the student scratching his head as the lesson continues at full pace. Once again, the program sadly lacks flexibility in responding to the user's needs. Although there is a pause feature implemented in the master cartridge, Dorsett does not use it during the lessons themselves. As a result, the student cannot stop the lesson to think about what was just presented without turning off the tape recorder.

In addition, *Physics* attempts to cover far too much. These eight tapes range from mass, the nature of matter, and Newton's laws of motion, to light and optics, electromagnetics, electronics, nuclear physics, and the theory of relativity. Any one of these could be more adequately handled in a course of its own.

There are a number of excellent books on physics written for all levels of interest and knowledge. There are also good physics classes at most high schools and community colleges. Most people would be better advised to spend a fraction of the \$60 this course costs for what would almost certainly be a richer educational experience.

Reading Comprehension

Dorsett has produced two reading comprehension courses for the fourth grade through junior high school student. The stories encompass a variety of topics ranging from surfing and jazz to the Lewis and Clark expedition. The teacher can use these topics as a teaching aid to focus on particular aspects of the text (such as symbolism, historical background, or character motivation). For example, *Sacajawea* lends itself to the study of historical background. Sacajawea was the Shoshone woman responsible for saving the lives of the men on the Lewis and Clark expedition. Students learn the story of her life and something about the historical period as well. At the same time, the student becomes aware of sentence structure and vocabulary, thus enhancing linguistic skills.

Reading Development U: Levels 1-2

These tapes are labeled "Reading Comprehension." They definitely *do not* teach any form of comprehension, but appear to be designed to teach pattern recognition. Each frame writes a short (three to six word) sentence on the screen. The narrator reads the sentence to the pupil. One of the words in the sentence is underlined or set off by a contrasting background color. Three words from the sentence are written at the bottom of the screen, and the narrator repeats one of these words orally. The pupil is to press 1, 2, or 3 to indicate which word was spoken. As this word is clearly indicated in the sentence above, the pupil merely needs to note which word is wanted and match it with one of the three words at the bottom. The pupil need not comprehend the meaning of the word or sentence, or even match the sound of the word to its written form.

Strangely enough, the first two tapes do not underline or otherwise indicate the desired word, but from tapes three through sixteen, it is always indicated. It makes better sense to reverse this procedure. This would have made the tapes more valuable as a listening skills tool, and also would have reinforced phonics skills by requiring the pupil to listen to the word, and *then* find it in the list at the screen bottom.

Given the need for teaching pattern recognition, a teacher would find these tapes useful in preschool or kindergarten, or perhaps with children whose ability to learn is impaired. However, these tapes are labeled level 1 and level 2. In the first and second grades pupils would find them of little value or interest. Beyond tape 2, it is not even necessary to listen to the narrator. The pupil merely looks for the word at the bottom which matches the word indicated in the sentence. This set of *Reading Development* tapes has both the positive and negative features mentioned in the general review of the Dorsett Educational Systems packages.

The author's values occasionally intrude into the presentation of some of the terms here. For instance, girls do not like snakes and faint at the sight of blood or mice; boys ride horses, raft, run, and swim; and reptiles are ugly and unpleasant to look at. The great majority of frames are well presented and do not suffer from this bias, but the few that do should be revised. Also, a few terms are presented in a manner that confuses their meaning. Ancestor, for example, is "someone who came before you." The question, "Would your younger sister be your ancestor?" leaves the impression that your "older" sister could logically be your ancestor.

These tapes could be used in the classroom for a general vocabulary review or enrichment. As there is no related grouping of terms, a teacher cannot select a tape which applies to a particular area being studied by the class.

Reading Development V: Levels 3-4

These sixteen Reading Comprehension programs are probably suitable for use in the later months of the third grade and throughout fourth grade. Fifth or sixth grade pupils with reading problems might also use them for practice.

This series of eight cassettes gives a wide selection of vocabulary words, their definitions, synonyms, antonyms, etc. The pupils do read part of the material on their own, and comprehension is the major skill required to complete the tapes successfully.

The format of ten programs (the other six will be discussed later) presents a sentence or two utilizing a term, followed by a definition, perhaps a little more information, and finally some form of exercise. This may require selecting a word or expression to complete a sentence, or an antonym or synonym for the term. The pupil is asked to find the answer among two or three words. The problem with many of the frames is that the answers are much too obvious. Sometimes the selections are reasonable and will cause the pupil to think or analyze what they have been told; but all too often no thought is required. For example: "Find a word that means spoken or written speech." The choices are: "language, glue, football." On three or four tapes, the definitions are blanked out before the questions appear, but only one tape does this consistently. This good idea should have begun after the first tape had

familiarized the pupil with the format and procedure and continued throughout the rest of the tapes. It would have greatly increased their educational value.

Six programs have a format which would improve all the tapes. These two tapes are designed as stories which incorporate the vocabulary throughout. A few frames of the story are presented, then many of the words defined or used in different ways. As the story continues, this pattern repeats itself and helps expand the user's vocabulary. The stories are entertaining and educational. Unfortunately, all the other tapes present two to four frames relating to one term and have no connection to the tape as a whole. These tapes will not hold a pupil's interest for very long.

There is no pattern to the selection of words on these tapes. They are not grouped into nouns, adjectives, emotions, etc. For instance, one tape covers the following terms in this order: victory, terror, announcement, mystery, nonsense, opinion, pride, problem, purpose, relief, luck, anger, appearance, blame, expert, health, freedom, and information. Some form of continuity, such as a story or a logical grouping of words, would produce tapes capable of holding a pupil's interest much longer.

Working with Fractions

Working with Fractions is designed for use by fourth through eighth graders. Assuming that the fourth graders are somewhat advanced, the eighth remedial, and all others somewhere in between, this seems a fair evaluation of the level.

Starting with the fraction as a numerator, demoninator, and a fraction bar, the student is given a good look at the form of a fraction. Most of the graphic screen illustrations given are very good, but those in circular form come out distorted. Some concepts are repeated to a degree that will bore the more advanced student.

After this introduction, the series goes immediately to the multiplication of fractions, an unusual sequence in teaching operations with fractions, but one which seems effective here. Progressing through the programs to reducing fractions, addition and subtraction, division, and working with mixed numbers, the student eventually finds programs converting to decimals and percents. It is difficult to explain why the next series, on fractions, has a whole program devoted to the circle with only a few examples using the fractional approximation of pi. This program on circles would fit much better into the lesson on geometry, where it is missing and is needed.

While there are some interesting and well done parts to this lesson, it is difficult to recommend it very highly. There are numerous errors and flaws. It doesn't have the necessary element of excitement to hold the attention of a student for any length of time. However it does give a good picture of this difficult subject area, and, perhaps with progress check cards and reference folders, these programs could find a place in the classroom.

Spelling

The most positive feature of this program is the reinforcement of the meaning of the spelling word: the student is required to use the correct word in sentences in certain sections of the course. However, the student should actually be spelling the word, not simply using the multiple choice format. Drills for rules concerning plurals, suffixes, homonyms, syllables, and doubling the consonant letters are presented. In my view, too many concepts are presented at once. For example, the presentation of the homonyms "to, too, and two," is immediately followed by the rules for contractions. Also, there should be more drill on what the authors call "fussy letters," words that end in ss, ch, sh, x, and z, before proceeding to words that end in o and the y family. Within the multiple choice format, the questions are phrased in a variety of ways; thus, you do not become bored nor accustomed to a repetitive format.

United States Government

The student commences the program with the birth of the Constitution, and then proceeds to discover the basic principles of government at the city, state, and federal levels. Again, the format is multiple choice. Some of the questions concerning typical governmental activities require the student to apply learned materials. For example, one scenario involves a lawsuit, and the student must choose the appropriate court to hear it. With this method, the student must think about the situations rather than supply a rote memory response. But the multiple choice format can also be too confining. To the question "What is the purpose of state government?", for instance, the intended answer ("To promote peace and order") leaves a great deal unsaid.

Review sessions for an entire lesson cover the pertinent materials and are well done; it is a pity review sessions are not available on the history tapes.

World History and *United States History* are two separate courses designed to help the student comprehend the modern world and the forces that shaped it. *World History*, which does not in fact cover the world but focuses on events in Europe and America, traces Western man's history from the earliest struggles of the caveman to the momentous events of today. Beginning with the Age of Exploration, *U.S. History* outlines America's story right up to the early Reagan Administration. Here again as in other programs, too much information is condensed; but the major dates and relevant facts are discussed. For example, in the "Industrial Revolution" section, the program concentrates on the transition from a predominantly agrarian society to our present urban one dominated by machine manufacturing processes in industrial centers. Technological advances are emphasized, but the student is not inundated by reams of dates and lists of inventions. Only the broad concepts are stressed, a summary of events from that period of history. The review questions are appropriate; but, unfortunately, too few are provided for each section. For instance, in *U.S. History*, the authors explain the causes and events leading up to World War II; however, the questions posed only ask for one cause/one event responses. The program needs the additional feature of a group of summary questions at the end of the course. Because each tape in the series recapitulates preceding materials, the transition from unit to unit is very good. For all their limitations, these programs will be enjoyed by students in the fifth grade through high school, or even by college students and adults who wish to do a basic refresher.

Writing

Learning how to write can be an intimidating and overwhelming process. Unfortunately, the course *Effective Writing* is also overwhelming to the student. Too much information is presented at once. For example, expository writing as envisioned here should be one lesson; however, it is offered along with such mechanics of writing as grammar and punctuation. The orientation of the lesson on paragraphs is much too conceptual, and does not provide enough concrete examples. One whole program could be devoted to topic sentences; and the mechanics of building paragraphs in blocks of ideas needs to be stressed. First, a choice of words should be presented, followed by sentence structure, paragraph structure, and finally essay development. Unhappily, the authors do not present the topic as a logical progression.

The expository writing section makes too many diversified points about such topics as cause and effect, contrast, method, conditions, sequence, and addition. One topic per lesson should be featured. Nor have the discussion questions been made very clear in some instances. "How could you define a topic?", for example, is unnecessarily vague. It would be better to begin by asking, "How does expository writing differ from descriptive writing?"

Finally, like many of Dorsett's packages, this one suffers from a woeful dearth of user interaction. The program presupposes the student to be a passive receptacle in which to pour information. Much needs to be done to involve the student more in the learning process, to keep his attention by at least demanding active responses.

MUSIC 1 TERMS AND NOTATIONS

Company: APX/Atari Program Exchange

Language: Atari Basic

Hardware Requirements: 16K, disk drive.

Department: Education

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING **B**
EDUCATIONAL VALUE **B**
VENDOR SUPPORT **C**

EASE OF USE **B**
DOCUMENTATION **B**
VISUAL APPEAL **B**

ERROR HANDLING **A**
RELIABILITY **A**
VALUE FOR MONEY **B**

Music 1 Terms and Notations is the first in a series of three modules introducing music theory through drill and practice. It is designed to enhance a music theory class, and works as a demonstration program, enabling students to utilize a variety of Atari computer commands.

The concepts presented include note types, note identification, enharmonics, definitions of musical terms, and major and minor key signatures. The documentation provides recording sheets for evaluation of the student's progress, as well as program explanation. Both the visual and sound effects of this program are clever and effectively reproduced.

MUSICAL COMPUTER — A MUSIC TUTOR

Company: Atari Program Exchange

Language: Atari BASIC

Hardware Requirements: 40K, disk drive

Department: Education

Sugg. Retail: \$17.95

Availability: 5

Disk or Tape: Disk

OVERALL RATING **C**
EDUCATIONAL VALUE **B-**
VENDOR SUPPORT **D+**

EASE OF USE **B**
DOCUMENTATION **B-**
VISUAL APPEAL **B-**

ERROR HANDLING **B-**
RELIABILITY **B-**
VALUE FOR MONEY **C+**

Musical Computer — A Music Tutor is a computer-aided instruction (CAI) program which teaches the fundamentals of musical notation. The course is divided into ten chapters. Some of these are straight "lecture," others are review tests, and the remainder combine the two. The entire course can be completed in under an hour, and is recommended for musicians aged 6 six years and up.

The major problem with this program is that it makes little use of the capabilities of the computer. The text is brief, and is displayed in a frustrating character-by-character style. (Perhaps someone ought to tell the author that people read a word at a time, not letter by letter.) The graphics are attractive, but would not have suffered had they appeared in a book instead of on-screen. If a user does badly in a quiz, the only options are to replay the same lecture or to try some more questions. A good CAI program should have some facility for providing a more detailed explanation of a topic, in case you don't pick it up on the first try.

The text itself is very brief. It tells you what symbols mean, without ever explaining why anyone would use them. If you ever learned mnemonics like "Every Good Boy Deserves Favor" and "F-A-C-E" to remember where notes reside on a staff, you already know most of what *Musical Computer* attempts to teach.

MUSIC MAJOR

Company: Educational Software

Language: BASIC

Hardware Requirements: 32K

Department: Education

Sugg. Retail: \$39.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING **A**
EDUCATIONAL VALUE **A**
VENDOR SUPPORT **B**

EASE OF USE **A**
DOCUMENTATION **A**
VISUAL APPEAL **A**

ERROR HANDLING **A**
RELIABILITY **A**
VALUE FOR MONEY **A**

"Learn the basics of music with this lighthearted but very thorough approach," claim the authors of *Music Major*. Lighthearted it may be, but this program requires persistence and patience as well. The beginning music student must use the documentation as a guide, and would be well advised to use it in conjunction with an introductory theory class and music lessons. The program teaches music theory and recognition of piano keys, notes, counting notes, counting measures, and key signatures. While doing so, it makes effective use of the Atari's impressive visual and sound effects. For example, when a happy face appears on a key of the displayed piano keyboard, pressing the corresponding key on the computer keyboard generates the sound of that note. You learn how to read a time signature and name the major and minor key signatures as well.

The program includes two other options worth noting, the Teaching Mode and the Quiz Program. Pressing the Option and Return keys moves you to Teaching Mode, used in the exercises. Let's say you want to find C sharp on the displayed keyboard. When you enter "C" and "S" and press Return, a happy face appears on the C sharp key. To use the Quiz Program, you must create data statements to drive the Quiz Master Utility. The documentation tells you how to do this, but you do need some knowledge of BASIC. It is not as easy as it sounds. You can create your own quizzes once you have mastered the technique, or depend upon the questions asked throughout the presentation of Beethoven's life. I liked the inclusion of the first few measures of his Fifth Symphony. All in all, I thought the lessons flowed smoothly from simple to complex and suited an age range from six years through adult. Music students and teachers will welcome the reinforcement of musical concepts that this program offers.

JUGGLES' RAINBOW & JUGGLES' HOUSE

Company: Atari, Inc.

Language: BASIC

Hardware Requirements: 16K

Department: Education

Sugg. Retail: \$29.95

Availability: 4

Disk or Tape: Disk

OVERALL RATING C+
EDUCATIONAL VALUE C+
VENOOR SUPPORT B

EASE OF USE B
DOCUMENTATION B
VISUAL APPEAL B

ERROR HANDLING B
RELIABILITY B
VALUE FOR MONEY C+

Atari has produced two programs for the three through six year olds designed around lessons taught in kindergarten and the first grade. *Juggles' Rainbow* addresses the concepts of *above*, *below*, *right*, and *left*. In it, Juggles the Clown helps the young student work his way through three separate programs selected from a picture menu. Each of the three programs follows the same basic format. The child starts off making simple moves using the directions *above*, *below*, *right*, and *left*. Each program ends with the creation of a colorful figure displayed as a result of the use of these four commands.

Juggles' Rainbow stresses the concepts of *above* and *below*. To aid the child a blue strip of paper is placed horizontally across the center of the keyboard. This corresponds to the blue line across the center of the screen. When the child pushes a key above the blue strip, a line appears on the screen above the blue line. The child can experiment to see where the lines will appear. The next portion of the program instructs the child to push a key either above or below the blue strip. If the child misses twice he is sent back to the beginning for more practice. He is rewarded for knowing the difference between *above* and *below* in the final section of the program.

By selecting keys either above or below the blue bar the learner creates a rainbow with color coordinated raindrops. One final step of the program is to get the raindrops to match up to the colors of the rainbow that are directly above them. Again, this is accomplished by pressing either above or below the blue strip.

The second program is called "Juggles' Butterfly." It works the same way as the first program except this time the learner is working with *right* and *left*. Now the blue strip is placed vertically up the center of the keyboard so that it matches the blue line on the screen. This program ends with the creation of a colorful butterfly.

The third program combines *above* and *below* with *right* and *left*. This one is called "Juggles' Windmill," and when the user is able to distinguish between these combinations of directions the end result is a multi-colored windmill.

Juggles' Rainbow is a program that lets very young learners utilize the computer. However, because it is limited to just these four ideas, which it repeats in one format over and over, young users do not want to play with it repeatedly. The three year old who helped me to review this package found that twice through these programs, getting basically the same results each time, was enough.

Juggles' House is designed around the concepts *inside*, *outside*, *upper*, and *lower*. Upon loading the disk into your computer, you can select from the following options: (1) Juggles, (2) the House, or (3) the Toyshelf. The first module allows the child to choose the game speed and provides hints and clues. "The House" option stresses the concepts *inside* and *outside*. The package includes a blue piece of paper shaped like a window which is placed over the keyboard. Keys T, Y, U, G, H, and J fall on the inside of the border, while the remaining keys are designated the outside keys. A blue line across the center of the screen marks off colored boxes that appear either inside or outside the blue line. The child explores inside and outside by depressing any key within or without the blue border. Depending on the key, the computer responds with "that was inside," or "that was outside."

After five such responses, the child is asked to follow new directions. Colored boxes now appear either inside or outside the blue border, and the selection process proceeds. Two incorrect responses and the child is required to return to the first part of the program for more practice. After five correct answers, a different shape is displayed on the screen, and the strategy now makes use of ten keys. If this portion is successfully completed, the "playground" is presented as a reward. Here, pressing keys inside the blue border causes furniture to appear in the different rooms of a house. The scenery surrounding the house is generated by pressing the keys outside the blue border. Additional keys will produce flying birds, the wagging of a dog's tail, and so on.

"The Toyshelf" portion of the program works the same way with the concepts *upper* and *lower*. The child repeats his on-screen exploration of the concepts by following the directions. The "Playground" portion requires the child to put toys on the toyshelf. Depending upon which key he presses, the toys will appear on the upper or lower shelves.

The animation, color, and presentation make these programs a joy to use. In addition, the programs lend themselves to other areas of learning, such as familiarizing the child with the computer keyboard. The parent or teacher can expand on the events that occur in *Juggles' House* or *Juggles' Rainbow*. For example, the child can count

the objects in the house, name colors projected on the screen, and make up stories about what he sees.

Since there is not much variation in the format or ideas, repeated use will become tiresome for the young child. The programs will work well, however, in the classroom setting where a number of children can work with them during the school year. Repeated home use will cause interest to dwindle and so be short-lived.

KINDERCOMP

Company: Spinnaker

Language: BASIC & Assembly

Hardware Requirements: 48K

Department: Education

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING **B**
EDUCATIONAL VALUE **B**
VENDOR SUPPORT **B+**

EASE OF USE **A**
DOCUMENTATION **B**
VISUAL APPEAL **B**

ERROR HANDLING **A**
RELIABILITY **A**
VALUE FOR MONEY **A**

Kindercomp, designed as a learning aid for children aged 3 to 8 years old, is a colorful and creative series of games which provide a non-threatening introduction to the Atari computer through the use of its keyboard. The child learns such important concepts as upper and lower case letters, number sequence, and skills involving the perception of patterns. There are six games in all, three of which are specifically devoted to acquainting the child with the computer keyboard. The instructional games are certainly enjoyable, but they could have offered a greater challenge to the child.

The six joystick-controlled programs included are: Draw, Scribble, Names, Sequence, Letters, and Match. The "Draw" program is highly enjoyable. Here you'll first need to decide on the thickness of the line that you'll use, then whether you want to draw on a black background or a white one. You can fill in any enclosed area and stop the drawing at any time, and you can change the color of the picture by pressing the 1, 2, or 3 keys. Additionally, you can have various parts of the picture you draw "blink." Unfortunately, one feature can prove more of a hindrance than a help: you erase the drawing by pressing the space bar, and this forces you to start your masterpiece over again should you accidentally touch it. It is sometimes difficult to explain to a three year old why something isn't there any more. The program will not allow you to save pictures to disk.

The two programs "Scribble" and "Names" are aimed at familiarizing the child with the keyboard. "Scribbles" allows the user to press any key and watch it repeat itself for a full line. By pressing the "Atari" key or the Caps Lock key you can change the color of the characters. "Names" is designed to accept up to fifteen characters (words, phrases, etc). After they are entered they can be moved all about the screen in rhythmic patterns, accompanied by sound effects.

"Sequence," "Letters" and "Match," the final programs, offer the child experiences in the ordering of numbers, letter recognition, and the matching of given patterns, respectively. With each program you are rewarded with both sound and color displays after correctly answering five problems.

Kindercomp represents quite a decent learning experience, so long as you remember that it's aimed at the younger child. It is not trying to compete with the more sophisticated educational programs on the market.

HICKORY DICKORY

Company: APX/Atari Program Exchange

Language: Atari BASIC

Hardware Requirements: 16K cassette, 24K disk.

Department: Education

Sugg. Retail: \$15.95

Availability: 8

Disk or Tape: Both

OVERALL RATING **C**
EDUCATIONAL VALUE **C-**
VENDOR SUPPORT **C**

EASE OF USE **C**
DOCUMENTATION **B**
VISUAL APPEAL **C**

ERROR HANDLING **B+**
RELIABILITY **B+**
VALUE FOR MONEY **C**

In a post-digital world, *Hickory Dickory* assists children in learning to tell time on the old fashioned, round-faced clock (remember those?). The program is appropriate for children in kindergarten through the sixth grade level, and is set up to be used with either joystick or keyboard. A clock face appears with the hour and minute hands set according to the chosen difficulty level. In brief, the student must identify the correct time. Unfortunately, the visual appeal is minimal, and no tests or quizzes are included to test the student or provide incentive or rewards. There are other programs available that have more educational value than this one.

CAREER COUNSELOR

Company: MMG Micro Software

Language: Atari BASIC

Hardware Requirements: 32K

Department: Education

Sugg. Retail: \$59.95

Availability: 7

Disk or Tape: Disk*

OVERALL RATING **B-**
EDUCATIONAL VALUE **C+**
VENDOR SUPPORT **B**

EASE OF USE
DOCUMENTATION **B**
VISUAL APPEAL **B**

A-
B
B

ERROR HANDLING **A**
RELIABILITY **B**
VALUE FOR MONEY **B-**

Career Counselor helps students explore career choices. The Main Menu gives you two options, Career Search and Career Dictionary. To begin narrowing the list of possible careers, choose Career Search. The Search Menu contains Interests, Aptitudes, Educational Level, Physical Demand, Variation of Task, Independence, Creativity, Leadership, Career Category, Earnings Range, and Employment Outlook. Each option includes a list of related choices. For example, Interests offers four items for consideration—data, people, things, plants and animals. You register a preference for each, thus lowering the number of career choices from the original 337. Once you have responded to each of the options, the computer uses your choices as search criteria. At any time, you can invoke the last option, List Careers, to find the careers matching your stated abilities, goals, and preferences. If you have this information printed out, you also receive a list of your responses to the items in Career Search.

Career Directory lets you examine each of the computer-selected careers in detail. You get the D.O.T. number, the current earnings level, and the employment outlook for each career. Supply and demand obviously influence the last two, so the program should be updated periodically. Otherwise, I don't think people involved in career counseling would find the program useful for very long.

The program works fine with single Percom drives and with Atari 810 drives, but it locked up the Atari keyboard when used with a dual Percom disk drive. Except for these weaknesses and the problem with updating mentioned above, I thought the program well done and informative.

THE ADVENTURES OF PROTO

Company: Educational Software, Inc.

Language: BASIC

Hardware Requirements: 24K; joystick.

Department: Education

Sugg. Retail: \$24.95

Availability: 4

Disk or Tape: Disk

OVERALL RATING **C-**
EDUCATIONAL VALUE **C**
VENDOR SUPPORT **C+**

EASE OF USE
DOCUMENTATION **C+**
VISUAL APPEAL **C+**

B
C+
C+

ERROR HANDLING **B**
RELIABILITY **B**
VALUE FOR MONEY **C**

The Adventures of Proto, designed for 4 to 8 year old children, presents three parts: "Coloring Book," "Playtune," and "Mars-Mellows." A coloring book provided in the documentation relates the story of Proto, a friendly alien from another world who visits Earth. The title of the program is misleading, however, since its three parts are not about Proto's adventures. "Mars-Mellows" is the only program that features Proto on the screen at all. In this game, the child moves Proto across the screen using a joystick. The game's object is to help him catch in his bag the marshmallows falling from the spaceship. The speed can be set at slow, medium, or fast. "MarsMellows" may help to improve hand-eye coordination; unfortunately, the game is not that challenging and quickly becomes boring.

In "Coloring Book" the child uses the joystick to draw lines on the screen. Press the Option key and the speed changes. Pressing "P" will change the size of the lines. Other options include the ability to save pictures to a work disk and to change the ink colors used. It is again unfortunate that the colors are limited to three choices: black, pink, and blue.

"Playtune" is the best of the three programs. Imagine a four year old creating a tune on the computer and listening to it as it is played back. The computer keyboard and not the joystick becomes the input device for the piano keyboard which appears on the screen. Saving the song to disk and being able to change between piano and organ tones are excellent additional features.

The music program alone may well be worth the price of the package. Unhappily, the other two games are not really learning oriented, and are too limited. There are many more creative and challenging educational programs available for the Atari.

PRE-SCHOOL LIBRARY

Company: PMI

Language: Atari BASIC

Hardware Requirements: 32K

Department: Education

Sugg. Retail: \$23.95 each

Availability: 8

Disk or Tape: Both

OVERALL RATING **B-**
EDUCATIONAL VALUE **B+**
VENDOR SUPPORT **B+**

EASE OF USE **A**
DOCUMENTATION **B-**
VISUAL APPEAL **D**

ERROR HANDLING **B**
RELIABILITY **B**
VALUE FOR MONEY **B-**

Four lavishly packaged programs make up *Pre-School Library: Pre-School IQ Builder #1 and #2, Sammy the Sea Serpent, and The Adventures of Oswald*. PDI markets the programs individually, so you get a separate disk for each program, plus voice cassettes for the last two. You also receive colorful decals depicting the Sammy and Oswald characters.

Pre-School IQ Builder #1 presents six exercises that require a child to determine the likeness or difference between two objects. The objects include colors, shapes, figures, large letters, capital letters, and lower case letters. The child uses a joystick to indicate if the pairs of objects on the screen are the same or different. *Pre-School IQ Builder #2* continues with the same theme. Its six lessons include lower case letters, numbers, letter shapes, and two- and three-letter words. *Sammy the Sea Serpent* is a classic. Using a joystick, the child helps Sammy return to the sea. A voice cassette accompanies the program, synchronized so that the child receives a reward every time his or her efforts help Sammy get closer to home. The same set-up marks the last program. The child moves Oswald with a joystick and in the process learns concepts such as "to," "back," "climb," and "jump."

PDI is one of the pioneers in computer education, and this library contains four of their best programs. Unfortunately, while educationally sound, none of the programs makes good use of the Atari's sound and graphics capabilities. The graphics are out of date, and the use of a single sound register proved disappointing. However, the programs fulfill their promise. They succeed in teaching basic concepts to pre-schoolers and offer a rare opportunity for children to enjoy a computer without the shoot-'em-up violence that accompanies so much of today's software.

SAFETYLINE

Company: Maximus, Inc.

Language: Machine

Hardware Requirements: 48K

Department: Education

Sugg. Retail: \$29.95/cassette \$34.95/disk

Availability: 4

Disk or Tape: Both

OVERALL RATING **A-**
EDUCATIONAL VALUE **B+**
VENDOR SUPPORT **B**

EASE OF USE **A**
DOCUMENTATION **A**
VISUAL APPEAL **A**

ERROR HANDLING **A**
RELIABILITY **A-**
VALUE FOR MONEY **B+**

Safetyline, starring Max the cat, is one of a series of programs called Software Designs for Developing Young Minds. This set of programs should appeal to children from four to eight years of age. The package consists of a double-sided disk, each side containing a story narrated by Max the cat and two games related to the story. Max is the "secret friend" of Sam, a young boy. Each story (or movie) consists of Max helping Sam to learn a set of safety concepts. Max's mouth movements match the narration on the tape, as does the animation. This is all very well done.

"Sam Goes To School" presents safety tips for crossing streets. "Sam Gets Lost at the Zoo" helps children learn what to do if they become lost. Both stories are interesting, but the pauses between lines will be too long for many young children. Four games help reinforce the tips. Each game may be played using the keyboard or a joystick. Younger children will probably find Streetcross, which moves Sam to school, and Zoomaze, which helps Sam find his teacher, most enjoyable. Older children will be more likely to play Hidden Tips, a simple one word puzzle, and Tipmatch, a concentration game. As three of the games have two levels, easy and hard, they are appropriate for different age groups. Hidden Tips and Tipmatch may be played by one or two children.

Younger children will need the games explained the first time they play them. After this, only the program loading need be done by an adult. Once the program begins and the movie (Start button) or the games (Option button) has been selected, everything is very easy. As the games have no tape narration, they can be played over and over without rewinding the cassette. Older children will soon learn to rewind the tape and press Reset to load the movie from the disk. This is an enjoyable, well-designed program for young children.

PILOT

Company: Atari

Language: Pilot

Hardware Requirements: BK [home]
16K [school]

Department: Education

Sugg. Retail: \$79.95

Availability: 9

Disk or Tape: Cartridge and tape

OVERALL RATING A -
EDUCATIONAL VALUE A +
VENDOR SUPPORT B +

EASE OF USE A
DOCUMENTATION A -
VISUAL APPEAL A +

ERROR HANDLING A -
RELIABILITY A
VALUE FOR MONEY A

Those familiar with the concept of *Logo* will welcome Atari's version, *Pilot*. Atari's *Pilot* (Programmed Inquiry, Learning or Teaching) is a programming language with "turtle graphics." It is easy to learn and easy to use, with simple syntax and textual rather than a mathematical orientation. *Pilot* utilizes the extensive capabilities of the Atari computer, including full screen editing, lower as well as upper case characters, the graphics keyboard, and full sound and color features. *Pilot* is recommended for ages 8 to adult, and most users should be able to write simple, but interesting programs after a short working session.

There are two packages available: the Home package and the School, or Educator's package. The Home package contains the *Pilot* Language in the easy to use cartridge form, a 107 page spiral bound Student *Pilot* reference guide, and a Pocket reference card. The School package, which comes in a heavy duty loose-leaf binder with a plastic holder for the cartridge and tapes, contains all of the above materials plus the 191 page spiral bound *Pilot* Demonstration Programs User's Guide.

One feature of *Pilot* that makes it very user friendly, particularly to younger students, is the use of abbreviations for commands. Almost all of the text commands are abbreviated to one or two letters followed by a colon. These include T (type to screen); A (accept from keyboard); M (match command); J (jump command); and SO (sound command), to list only a few.

The Student Reference Guide is interesting and easy to follow. It gives numerous, full-color illustrations on screen. The cartoon turtles used throughout the manual to illustrate points and to instruct are an added attraction. The Guide begins with simple programs and carries the student easily along, introducing first T (TYPE) in several short programs, then on to add A (ACCEPT) and M (MATCH). Just these 3 commands make many different programs possible. The executive commands include AUTO, which will automatically number program lines, and REN which will renumber program lines by any increment.

Pilot graphics are easy to use and are well explained. Even the beginner can quickly begin to draw boxes, triangles, circles, and perform simple, animated graphics. Three different "pen" colors can be used in TURTLE GEOMETRY, and PEN ERASE will remove lines. The absolute commands GOTO, TURNTO, DRAWTO, and FILLTO use simple coordinates to tell the turtle where to go. Relative commands like GO, TURN, DRAW, and FILL all operate in relation to the present position of the turtle.

Pilot allows straightforward use of sound. It can support up to four voices at one time, and will play a range of two and one-half octaves. Music does, of course, add great interest and variety to any program.

The simplicity of the *Pilot* language, together with a natural curiosity about the workings of the computer, will lead most students into more complex and creative programming. From simple patterns, they will expand concepts. For instance, a star becomes a star that changes colors, next a moving star, and finally, great numbers of moving stars.

Pilot permits use of peripheral devices. It can be used in conjunction with a disk drive, a cassette player, joysticks, paddles, or a printer. There is a CALL command for utilization of machine language routines, and an equivalent of PEEK and POKE; therefore, the door is open for advanced programmers to experiment with BASIC or other languages.

The *Pilot* Primer (for teachers, parents, or older students) covers the information in the *Pilot* Student Manual. However, it goes into more depth and introduces a lot of new material. At the end of each section is a summary of the material, terms and commands, and a review quiz. These are well done, and could easily be used by teachers in the classroom, by parents guiding their own youngsters, or by students who are mature enough to work their own way through both manuals.

Teachers will find *Pilot* helpful in preparing classroom programs for virtually any subject. Tests, interactive stories, and review lessons in math, grammar, and science are only a few of the types of programs which can be developed. The easily added sound, color, and graphics capabilities provide depth and interest to the program.

Pilot also offers an excellent language to introduce students to computers. The simplicity of the commands, the logical syntax, and the wide range of capabilities are easier to learn and use than BASIC. In addition, students who later discover that they want to go on to learn BASIC should find it reasonably easy to transfer the knowledge.

Overall, there is a very good software package. The manual is a little choppy in spots, but it is not difficult for even a child of 8 to 10 to make progress through the selections. *Pilot* is a simplified language, and as such, does not directly support all the things BASIC will do. However, this is what makes the language so suitable for students and for teachers. A relatively small amount of study and work will produce impressive results.

TEACHER'S AID

Company: Dynacom

Language: BASIC

Hardware Requirements: 24K

Department: Education

Sugg. Retail: \$13.95 cassette/\$17.95 disk

Availability: 6

Disk or Tape: Both

OVERALL RATING C -
EDUCATIONAL VALUE D +
VENDOR SUPPORT B

EASE OF USE B
DOCUMENTATION C -
VISUAL APPEAL C +

ERROR HANDLING B -
RELIABILITY A
VALUE FOR MONEY C +

Teacher's Aide is a math program which provides problems for reviewing the fundamental math operations of addition, subtraction, multiplication, and division. The program advances from single digit problems at Level 1, to four and five digit problems at Level 5.

A student selects a series of problems which are displayed one at a time on the screen. Since there is no time limit involved, a student may proceed at his own pace. Three attempts at the correct answer are allowed before the computer provides that answer. At the end of a series, the score is displayed, first with color and sound lighting up a portion of the screen corresponding to the percentage of correct answers, then by giving out the correct and incorrect numbers, and the final correct percentage. The pupil is given a chance to review the problems missed the first time around, which provides a nice feature of learning reinforcement. A score of 100 percent, finally, produces some extra hoopla involving mediocre graphics.

The manner by which *Teacher's Aide* calculates the correct percentage is unusual. Normally, scoring counts only the number of correct answers in relation to the number of questions. This system counts the correct responses in relation to the number of attempts which were made. This could be as high as 3 per question, resulting in some strange numbers.

One interesting feature of this program is the multiplication module. This allows the student to answer the entire problem at once, or to work out the sub-products in the longhand procedure. In the division module a similar procedure is available. The manual states that these features make the program a learning experience rather than a drill. However, when the student is unable to perform one of the steps correctly, the program does not present an explanation of the logic for solving it. Instead, it merely gives the answer for that step. From Level 3, most students will probably need to work out the problems on paper and then enter their answers.

Teacher's Aide provides a workbook-type drill in addition, subtraction, multiplication, and division, for home or elementary classroom use. The Break key should have been disabled to prevent accidental disruption of the program. Since it has not been, students would have to be instructed to type CONT if they accidentally pressed it. Other than that, students are automatically returned to the Main Menu at the end of every exercise, or by pressing "B." The graphic displays are uniform and lack variety, and the anticipation value is rapidly diminished. Improved graphics would add to the program's educational value.

Teacher's Aide is an unimaginative program consisting of mere math drills. Where much is possible with the Atari computer, from game to adventure formats, math can also be made enjoyable and even exciting. This program has missed the boat.

WHAT'S DIFFERENT

Company: Program Design, Inc.

Language: Atari BASIC

Hardware Requirements: 8K, disk drive

Department: Education

Sugg. Retail: \$18.95 cassette / \$23.95 disk

Availability: 5

Disk or Tape: Both

OVERALL RATING C
EDUCATIONAL VALUE B
VENDOR SUPPORT B

EASE OF USE B
DOCUMENTATION B
VISUAL APPEAL C

ERROR HANDLING D
RELIABILITY B
VALUE FOR MONEY B -

What's Different is a series of ten games. In essence, they all work the same way by presenting the user with four-word groups, and asking which word is out of place, or "what's different" in that particular group. The games present words from standard graded reading lists, with the words in Game 1 being of second grade level, and those of the last three games matching sixth grade achievement. If a child fails to select the correct word, the problem is presented again and again until he either "lucks out" or gives up. Each game consists of 25 words, although the student may choose to stop at any time. If he stops, his score is read — right answers and wrong guesses.

The program is relatively free of distracting bells and whistles, except for the frequent intrusion of the PDI logo. But it appears to have some reliability problems. When I tested it on the 48K computer, the program continually selected the first game, while on 16K, it allowed me access to only 1 to 3 of the 25 words before cheerfully terminating with a, "let's play again some other time."

Later, maybe.

WHAT'S IN YOUR LUNCH

Company: Lawrence Hall of Science

Language: Atari BASIC

Hardware Requirements: 16K Cassette; 32K Disk

Department: Education

Sugg. Retail: \$24.95

Availability: 2

Disk or Tape: Both

OVERALL RATING **C**
EDUCATIONAL VALUE **C-**
VENDOR SUPPORT **C**

EASE OF USE **C**
DOCUMENTATION **C-**
VISUAL APPEAL **C**

ERROR HANDLING **C+**
RELIABILITY **B+**
VALUE FOR MONEY **D**

What's in Your Lunch provides you with quantitative information about the nutritional content of common lunch items. The program comes with a menu card listing 117 lunch items (49 in the cassette version). These items are grouped into ten categories such as sandwiches, dairy products, fruits, beverages, sweets, and so forth.

The program asks for your name, age, height, sex, and activity level, and you enter the numeric code for up to nine items eaten at lunch. The program calculates the number of calories you need per day. It assumes that one-third of those calories should be consumed during each meal. The program then graphs the percentage of the following items: calories, protein (grams), fat (grams), sodium (mg), calcium (mg), iron (mg), riboflavin (micrograms), vitamin C (mg), and vitamin A (mg). It indicates whether you consumed more or less than one-third of the daily requirement.

That is the extent of the program. You cannot obtain a printout, nor add breakfast and dinner to get a total for the day. The food list includes only lunch items, though it allows you to add lunch items not in the program. However, every item added must be researched for the nutritional data. The documentation includes information about basal metabolism rates, mean heights and weights and recommended energy intake, activity levels, and recommended daily allowances of nutrients, but does not give any information about running the program.

PICTURE-PLAY

Company: Edupro

Language: BASIC

Hardware Requirements: 16K cassette; 24K disk

Department: Education

Sugg. Retail: \$24.95

Availability: 6

Disk or Tape: Both

OVERALL RATING **D**
EDUCATIONAL VALUE **D-**
VENDOR SUPPORT **B+**

EASE OF USE **B-**
DOCUMENTATION **B-**
VISUAL APPEAL **D-**

ERROR HANDLING **B**
RELIABILITY **B**
VALUE FOR MONEY **D**

Edupro has consistently developed programs which are educationally sound, but which do not make full use of Atari's sound and graphics capabilities. Because of their solid educational fundamentals, it is easy to forgive a lack of sophistication in the "bells and whistles" of Atari graphics—up to a point. But since this program is totally visual, it rises or falls on its use of the Atari's graphics capabilities. Unfortunately, it finishes with a "thud."

Picture-Play enables up to four players to compose pictures using the standard Atari character set. You have the complete set of upper-case letters, numbers, punctuation, and a handful of the Atari graphics characters to use in your picture. You can draw a moose using the letter M, a landscape using the letter L—your imagination is limited only by the Atari character set, a tool inappropriate for composing pictures.

Picture-Play would be a winner if it introduced a handful of alternative character sets, or allowed you to take advantage of the four-color capabilities of Graphics Modes 1 or 2, but it offers none of these features. Still, don't let this program sour you on Edupro; they offer a line of fine education programs for the Atari. This package, however, seems to be a translation from another computer system, and it doesn't have what it takes to make it in the world of the Atari.

UTILITIES

Introduction	318
Basic Language Utilities	319
Disk Utilities	324
Communications	332
Character Set & Player-Missile Editors	334
Graphics Packages	336
Languages	346
Assemblers	353
Miscellaneous Utilities	364

UTILITIES

Utility programs are an integral part of making the easiest use of the Atari Computer. They run the gamut from disk repair programs to player-missile editors to mathematical programs and assemblers. Some of these programs are extremely useful, and will save the user hours of tedious work, not to mention frustration.

But what must you consider important when you look at the dozens of offerings that fill the dealers' shelves? Of course, it depends on your needs, and in which programming language you usually write. For BASIC programmers, you need a renumber utility. Machine language programmers need a good assembler and possibly a debugger. Disk drive owners might consider disk utility programs that are capable of editing and rewriting sectors on the disk.

Game programmers definitely need a good player-missile editor, and possibly a graphics package for creating Hi-Res pictures. For those who want to work in the third dimension, there are several programs that will create, rotate, and animate three-dimensional pictures.

Naturally, there are those who like languages. There are more advanced BASIC's as well as Pascal, FORTH, and C. And finally, there are mathematical utilities designed to help engineers or scientists solve formulas and equations simply.

The utility program market has burgeoned in the last year. Programs which were developed by individuals to make their work easier, and which were originally traded among friends, have been refined and offered commercially. The next year should produce programs that will meet every user's needs.

Basic Language Utilities

BASIC X/A

Company: Atari Program Exchange

Language: Atari BASIC, Assembly language.

Hardware Requirements: 16K cassette/24K disk.

Department: Utilities

Sugg. Retail: \$29.95

Availability: 5

Disk or Tape: Both

OVERALL RATING
EASE OF USE
VENDOR SUPPORT

A-
A
B

DOCUMENTATION
VISUAL APPEAL
ERROR HANDLING

A
A
B-

RELIABILITY
USEFULNESS
VALUE FOR MONEY

B
A
A

Basic X/A (Extended BASIC) is a nicely packaged array of BASIC programming utilities. Included in this package are a variable name or value lister, a variable cross referencer, a variable name changer, a line renumberer, a block line deleter, and an error checking utility. Each of these functions helps to take the tedium out of these aspects of BASIC programming.

After *Basic X/A* is booted up, you load in your program. Whenever you type DOS, *Basic X/A*'s main menu comes up. This menu, which looks similar to standard DOS 2.0S, has options for each of the above functions. Additional menu options allow you to call standard DOS, change output devices (i.e., printer, disk drive, screen), and return to BASIC. This centralized menu is both easy to access and simple to use.

The most powerful feature of *Basic X/A* lies in its ability to manipulate variables. This feature alone is worth the price of the program. With it, you will always know how many variables you have used (the Atari has a limit of 128); what you have named them; what their current value is; which lines each variable occurs in; and you can, in a single step, rename a variable and each of the occurrences. These can be real timesavers. If you have ever inadvertently given the same name to two different variables, or found a better name for a variable midway through programming, or desired to find a specific occurrence of the variable, you will greatly appreciate these functions. While many separate programs perform these functions, none offer such a comprehensive, centralized packaging as in *Basic X/A*.

The other helpful aids of *Basic X/A* are the line deleter, line renumberer, and an error checking program. The line deleter allows you to delete a line or range of lines. The line deleter, especially when deleting a large number of lines, is slow. The renumber function, however, is fast; it allows selectable increments, and can renumber referenced line numbers (e.g., GOSUB 100). It will not renumber reference expressions (like GOSUB A*B*C or GOTO XYZ), but will notify you of each of these occurrences. Both of these functions are useful in avoiding repetitive, boring programming tasks.

The error checking program will scan your program for common programming bugs, such as missing or improper line numbers, incomplete INPUT statements, and common BASIC syntax errors. It will also tell you where referenced expressions are used as line numbers. It cannot check for logic errors in programming (e.g., giving A5 instead of 6.). Further, it may miss BASIC structural syntax errors, such as in 10 REM : GOTO 100. This function is best used as a first screener for programming bugs.

One major inconvenience of *Basic X/A* is the lack of resident DOS functions. If you access the standard DOS, you must have MEM.SAV on your disk to save your program currently in memory, and then you must reload *Basic X/A*. This is both time consuming and inconvenient, and leaves room for such errors as losing your program. In addition, a BREAK key to abort each of these functions is needed if you change your mind—pressing RESET will lock up the Atari. Lastly, a caveat: 27K is the size of free memory when *Basic X/A* is in the Atari. If your program is very large, you may not be able to use this or many other resident programming aids on the market.

Basic X/A can be highly recommended. It is simple to use, has a small memory requirement (4K), offers a good variety of programming aids, and is very well documented. In general, *Basic X/A* tends to complement rather than to compete against other BASIC macro-utilities, such as MMG's *Basic Commander*. While each may offer the same functions (e.g., renumbering), each has strong points which seem to cater to differing needs, such as variable manipulation versus line autonumbering. Thus, you should carefully examine what your needs and expectations are before buying any of these several-utilities-in-one-package type of programs.

BASIC COMMANDER

Company: MMG Micro Software

Language: Machine

Hardware Requirements: 32K

Department: Utilities

Sugg. Retail: \$34.95

Availability: 5

Disk or Tape: Disk

OVERALL RATING **B**
EASE OF USE **B**
VENDOR SUPPORT **C+**

DOCUMENTATION **B-**
VISUAL APPEAL **N/A**
ERROR HANDLING **B+**

RELIABILITY **B**
USEFULNESS **B**
VALUE FOR MONEY **B-**

BASIC Commander combines several important BASIC utilities such as renumbering, block delete, and a mini-DOS into one package. In addition, it offers several less important functions: an automatic line-numbering generator, a variable lister, and ten function keys (including three that are programmable). These keys save typing statements of up to 36 characters.

The renumbering function is probably the most useful utility. The renumbering is fast (500 lines in 3 seconds), and correctly renumbers the references in GOTO, IF...THEN, TRAP, and other statements. Pressing the Select key activates the renumbering function. You are then prompted to enter the increment and start values, which means you can either renumber the entire program or the tail end. Sorry, you can't logically renumber a portion, as you can in a block delete.

The mini-DOS is also useful. Any programmer who has called DOS and suffered either a MEM.SAVE or forgot to save his program first will appreciate this function. Using six control keys, disk directories can be accessed and disks formatted; and files can be deleted, renamed, locked, or unlocked.

It's nice to have these utilities, but the program takes up slightly more than 7K of memory. The package is completely transparent to Atari BASIC. As long as you aren't experimenting with player-missile graphics, sound registers or the display list, simply hit the Reset key to restore the system to continue working on your program, and all is fine. Apparently the hooks needed to restore the utility program and its memory location are undocumented. The design philosophy appears to have been to create a program used primarily for editing the listing rather than editing during a test. In spite of this problem, the program replaces many separately packaged utility programs, and on the whole is a good buy.

BASIC DEBUGGER

Company: MMG Micro Software

Language: Machine

Hardware Requirements: 32K

Department: Utilities

Sugg. Retail: \$34.95

Availability: 4

Disk or Tape: Disk

OVERALL RATING **C+**
EASE OF USE **B-**
VENDOR SUPPORT **C+**

DOCUMENTATION **C+**
VISUAL APPEAL **C+**
ERROR HANDLING **A-**

RELIABILITY **B**
USEFULNESS **B-**
VALUE FOR MONEY **C+**

BASIC Debugger offers a set of tools that should help the BASIC programmer easily debug his programs. It allows you to follow the path of the program as it is being executed. It also allows the programmer to examine variables within the program without resorting to extensive print statements. Finally, it will cross reference the variables, print a list where each is used within the program, and even run a string search within your program.

Two display screens handle your requests. Your program listing can appear on the main screen while the program does a trace on the auxiliary screen. Any of the printouts can be sent to a line printer, while the two screens can be toggled with the Control-Z key. A split screen display can also be activated if desired.

The trace mode is the most important tool in this package. It allows a trace to be initiated from the beginning, or it can be activated after running the program up to a specific line number. In the step trace mode each line can be displayed rather than just the line number. It also prints the values of five variables (scalar, array, or string variables are allowed) to the auxiliary screen as you trace. You can test the values of a particular scalar variable using the TRACE WHILE option.

The program is fairly well protected from user goofs. The System Reset key sometimes bombs the system, but the Break key won't. It is best to keep backups of your program. Remember, programs that can be debugged are only those that do not change the display list or character set. Player-missile graphics can also be a problem, and this of course means that game programmers are unlikely to find much use for *BASIC Debugger*. It is most useful to beginning BASIC programmers who need to trace faulty logic. I think the utility has an audience, but be aware that it will only trace some of your problems.

BASIC PROGRAM COMPRESSOR

Company: Atari Program Exchange

Language: Atari BASIC

Hardware Requirements: 32K, Disk Drive

Department: Utilities

Sugg. Retail: \$17.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING **C+**
EASE OF USE **B+**
VENDOR SUPPORT **C**

DOCUMENTATION **B**
VISUAL APPEAL **B-**
ERROR HANDLING **C**

RELIABILITY **B**
USEFULNESS **C**
VALUE FOR MONEY **B-**

If you are already a crack programmer, know BASIC memory usage inside out, and disdain using REMark statements, then you won't have much use for this utility. Most the rest of us, however, can benefit from the *BASIC Program Compressor (MASHER)*. As most programmers are aware, it is difficult to achieve a fine balance between making BASIC programs easy to read and still making them low in memory requirements and so swift to execute. One of the unhappy tradeoffs in a structured, well-documented (REMarked) program is even slower execution in an already slow language; this also consumes more memory. The MASHER helps you to get the best of both worlds. You write your program with lots of comments and with one statement per line for easy readability. Then, when this version works well, you set aside a copy for documentation, revision, and maintenance. Using MASHER, you create a second copy with lower memory requirements and faster execution.

This utility merges short statements into multi-statement lines, removes REMark statements, and substitutes variables for frequently used constants. But it is *extremely* slow! Settle down for a long winter's nap when you run it on a large program. A BASIC compiler is needed to speed this one up.

Let me also caution you to avoid line numbers 3 through 9, and variables Q0 through Q999 in your programs, if you use this utility on them. Further, the statement CLR in your program will cause trouble unless you re-execute statements 3 through 9. You must replace "by hand" any GOTO's, etc., that refer to a variable rather than a constant, if these are affected by the compression process.

To run this program you need to know the number of variables in your program. You may count them (ugh!), make a good guess, and add a little for safety's sake. Or you may want to run either the *BASIC Crossreference Program* or *Variable Changer* programs from APX, since both give you this information more quickly and accurately.

The user manual's instructions are very good, and you will also find included some seldom-mentioned ways for you to reduce memory usage. Remember to test your program thoroughly after compressing it, to ensure that the logic hasn't been altered in the process. A pity it doesn't run faster.

MICROSOFT BASIC CROSS-REFERENCE UTILITY

Company: APX/Atari Program Exchange

Language: Microsoft BASIC

Hardware Requirements: 40K

Department: Utilities

Sugg. Retail: \$17.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING **B**
EASE OF USE **B-**
VENDOR SUPPORT **C**

DOCUMENTATION **C-**
VISUAL APPEAL **A**
ERROR HANDLING **C-**

RELIABILITY **B-**
USEFULNESS **B+**
VALUE FOR MONEY **A**

Because of the size and structure of Microsoft BASIC, when working in this language it often helps to break large programs into a number of smaller ones. These subprograms can either be called by a central executive routine or can call each other in sequence. Microsoft BASIC running on a 48K machine allows only about 20K for your program, less if the 850 is on-line. This equals about 12K less than is available with standard Atari BASIC. In spite of this, Microsoft BASIC far surpasses the 8K cartridge in power and provides the additional bonus of compatibility with other computers, many of which utilize a version of this language.

The natural solution to the problem of limited memory is to write a number of small programs rather than a single large one. Microsoft BASIC provides for this with excellent merge and chaining features. At the heart of this process lies the ability to pass variables (with their values) from one program to the next through the COMMON function. But to do this successfully you must know which variables are used and where in the program to find them. *Microsoft BASIC Cross-Reference Utility* provides a list of all variables in a program, the line numbers where they occur, and a list of lines that refer to other lines, such as GOTO statements. It proves an invaluable tool to the Microsoft programmer.

Although easy to use once you get the hang of it, the program contains a number of bothersome flaws. These begin as soon as you try to load the first of the two programs comprising the utility. According to the manual, you should

load the program as "D:MXREF." In fact, the program is stored on the disk as XREF. Once you've worked that one out, perhaps by calling DOS and rebooting Microsoft, another nasty surprise awaits. The utility actually consists of two programs, the first providing a title screen and requesting the file name to cross-reference, the device, and the file for output. This program then calls the main module, which does the actual work. Unfortunately, the operating instructions do not explain this. You must read the "Technical Discussion" at the end of the manual to find this information. The manual leads you to believe that once you have entered the file name, the program begins to search for that file. When I started, to keep from tying up my computer in a useless search of the program disk, I substituted my working disk before responding to the prompts. The program crashed—and crashed again until I determined the problem.

In addition to these annoyances, the program is touchy about device specifiers. If you enter a file name without "D:" or "D1:" preceding it, the program will crash, forcing you to reboot the title program. It also requires an output file specification other than "S:" (screen). If you have a printer, you will probably output to the printer anyway. If not, you must write a dummy file to disk.

Finally, the program runs slowly, being itself written in Microsoft BASIC. An 8K program takes from ten to fifteen minutes to cross-reference. As the program size increases, the time taken increases at a much greater rate.

In spite of these limitations, this utility does what it was designed to do and is easy to use once you have mastered its quirks. The price makes it a "must" for anyone seriously working in Microsoft BASIC.

MONKEY WRENCH

Company: Eastern House Software

Language: Machine

Hardware Requirements: 48K Atari 800 only

Department: Utilities

Sugg. Retail: \$49.95

Availability: 4

Disk or Tape: Cartridge

OVERALL RATING **A**
EASE OF USE **A -**
VENDOR SUPPORT **B**

DOCUMENTATION **B**
VISUAL APPEAL **N/A**
ERROR HANDLING **A -**

RELIABILITY **A**
USEFULNESS **A**
VALUE FOR MONEY **A -**

Monkey Wrench is a valuable programming tool especially for the Atari 800 BASIC users. This ROM fits into the right-hand cartridge slot, and allows you to do many of the functions that should have been built into Atari BASIC in the first place. Its best features, a BASIC programmer renumberer, an automatic line numberer, and the ability to delete a range of lines, are worth the price alone. It also includes a monitor among its other useful features.

The *Monkey Wrench* comes as a printed circuit board that is inserted in the right cartridge slot. This is a "bare bones" card with one 4K ROM; the other is empty. There is no enclosure, and for this reason, inserting may be prone to error. The documentation clearly shows the bottom of the circuit board facing the keyboard, but most users don't read the documentation every time they boot a program, and may wind up inserting it backwards. The board should have been clearly marked "top" and "bottom." Although the card is unlikely to be damaged if inserted improperly, there are no guarantees. The product's empty socket will likely be used in the future as an upgrade.

BASIC programmers will like the convenience of readily accessible utilities that normally have to be loaded from another program. All commands are transparent to normal BASIC editing. They are accessed with a "P" character followed by the command. Thus, to renumber a program starting with line 10 and incremented by 5's, type P R 10 5. This renumber feature automatically takes care of all referenced GOTO's, except those referenced by variables. And it is exceptionally fast, able to renumber a 250 line program in eight seconds. It can also change the margins of the screen and toggle the keyboard, so that you can use the arrow keys without holding down the control key. The program also has the ability to convert hex numbers to decimals and vice versa, without leaving the BASIC language.

A machine language monitor contains 15 commands. It allows you to display and alter both memory locations and registers. Commands are included for hunting for groups of hex, or ASCII characters of up to 20 bytes in length. It will disassemble memory, and save and load portions of memory to cassette. It also includes a memory test; one that is extremely slow, but accurate.

This circuit board can be used with or without the BASIC cartridge. It does use 8K of available memory. Thus, 48K machines that normally have 40K of user space with the BASIC cartridge now have only 32K of user space. The utility also uses portions of page 6 memory for a scratch pad, and may interfere with any user routines stored there. This feature may be accessed if the 850 Interface Module is on.

Monkey Wrench is a very good utility package for the price. The concise, 15 page manual is clearly written, and the product is certainly worth buying if you do a lot of BASIC programming.

COLORTRACK AND SOUNDTRACK

Company: Advanced Computing Enterprises

Language: BASIC

Hardware Requirements: 16K; cassette player or disk drive.

Department: Utilities

Sugg. Retail: \$19.95 cass./\$29.95 disk

Availability: 3

Disk or Tape: Both

OVERALL RATING **C -**
EASE OF USE **C +**
VENDOR SUPPORT **C +**

DOCUMENTATION **C**
VISUAL APPEAL **C -**
ERROR HANDLING **B**

RELIABILITY **B**
USEFULNESS **C -**
VALUE FOR MONEY **D +**

Colortrack and Soundtrack is a two program utility package that takes the guesswork out of using Atari's color and sound capabilities. Each of the BASIC programs are very easy to use and almost entirely controlled by joystick.

Colortrack allows the user to adjust any of the color registers being used in the eight graphics modes controllable directly from BASIC. The joystick button selects the appropriate register; moving up and down changes the color (0-15); and moving the joystick back and forth sets the luminance (0-14). In most graphics modes an enlarged number illustrates the effect of the color changes. In graphics mode 8, a cube is shown with the three faces each showing a different color. This is accomplished by "artifacting," or drawing the colors on every other line. By changing the color and two luminances, the colors on the cube can change dramatically. The values of each color register for all graphics modes are displayed at the bottom of the screen, so the user can write these down for later use in his program.

Soundtrack works in a similar way with the sound registers. The pitch is varied by moving the joystick up or down, while the distortion is changed by moving the joystick left or right. Each time the button is pressed the sound register values are displayed. These values also include the note value, if appropriate. The volume can be adjusted with the "+" and "-" keys. Normally, the sound comes from sound register 0. If the user wishes to develop a chord he can hit the Break key, type "SOUND 1, 121, 10, 4" to keep the sound running for the first note, type CONT, then work with the joystick to find the second part of the chord.

While the program should have allowed the user to switch between voices and so develop multi-voice sounds automatically (much like they do with color), it can't really be faulted for its lack of flexibility. Although it is simplistic, it is helpful for developing simple sound effects, like explosions, that rely on distortion values in the sound register. As far as helping to determine pleasing color combinations in the eight BASIC graphics modes, the program is very helpful. In sum, both programs, while not very sophisticated, are easy to use and helpful to beginning programmers.

Disk Utilities

DISKEY

Company: Adventure International

Language: BASIC & Machine

Hardware Requirements: 32K disk, 48K, 2 drives recommended.

Department: Utilities

Sugg. Retail: \$49.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING

B

EASE OF USE

C +

VENDOR SUPPORT

B

DOCUMENTATION

B

VISUAL APPEAL

B

ERROR HANDLING

B

RELIABILITY

B

USEFULNESS

A -

VALUE FOR MONEY

B

Diskey is one of the most comprehensive disk utilities that I have ever seen. It was designed with the knowledge that disk files get damaged through negligence or drive errors, and these files should be recoverable if at all possible. With this in mind, they put in some very powerful disk search capabilities and a copy routine that can copy virtually any disk that would normally be unreadable under DOS 2.0. This was necessary since a damaged disk may also have a damaged catalog, VTOC, or a marginally readable or bad sector that prevents a file from being read. In addition, there is a routine that will make auto-boot disks from most tapes.

Diskey is a keyboard command driven utility. While it is helpful and somewhat easy to use, if you know what you are doing, it can be potentially damaging to a disk if the user isn't careful. Since these ZAP-type disk utilities read, modify, and write individual sector data on a disk, if used improperly, they can cause more harm than good. Most of the write commands require a "Sure Response" prompt to initiate them (a feature that can be disabled if not needed). The author recommends that you make a copy of your damaged disk before writing to it, since the potential of further damage is ever-present while you work.

The utility has a number of routines that are purely informational. It can scan a disk and determine which sectors are good and bad. It can trace a file while looking for a break in the sector link. When it catalogs a disk, it can show which files have been left in an opened state but haven't been closed, and which files have been deleted. Data in any sector can be displayed on screen or dumped to the printer. This print feature is available for any screen display. There are also routines that will allow you to adjust your disk drive speed, and ones for converting decimal to Hex and Hex to decimal.

Diskey has a number of search routines. It can search a part or all of a disk for any ASCII or Hex string, or even search through a particular file for that string. Moreover, it is powerful enough to find the code that goes into a memory address.

In most cases errors or information are repaired by modifying data within a particular disk sector. Any sector can be read into the buffer where it is displayed in both hex and ASCII. While in the modified mode the cursor is moved around the screen with the arrow keys, and advances automatically after changing any byte. You exit by moving the cursor off the bottom or top of the screen. A sector can also be quickly zeroed, if necessary, with a single key stroke. This, and the write back to the disk, require a confirmation prompt.

Although many errors require considerable user insight and experience, *Diskey* offers a number of automatic repair routines. There is a pseudo-erase routine that updates the boot sectors, the VTOC, and the disk directory without actually reformatting the disk. This is generally of use to people with slow format drives. There is also a VTOC repair routine that traces each file and, if in order, updates the VTOC record. The most complicated routine is the special file copy routine, this attempts to salvage a file on a disk with dead directory sectors. You must know, or determine, the starting sector. Many of these copy routines require two disk drives, and there is an alternative set of routines that will work on single drive systems at a much slower speed where numerous disk swaps are required.

The documentation is most informative. In 60 pages the author discusses how the disk operating system and its file manager works, methods of repairing blown disks and bad files, and the operation of each of the commands. While the information is likely to be over the heads of most users, it is explained in a clear, straightforward manner.

In the eyes of software vendors, *Diskey* may have gone too far in allowing users to copy and modify all disks. Nonetheless, it has a rightful place in everyone's library. It is an important utility that is useful to anyone who needs to recover files or data from damaged disks. *Diskey* may not be the easiest to use utility, but it is a powerful one.

DISKETTE LIBRARIAN

Company: Atari Program Exchange

Language: BASIC

Hardware Requirements: 24K; disk drive; printer recommended.

Department: Utilities

Sugg. Retail: \$24.95

Availability: 9

Disk or Tape: Disk

OVERALL RATING	B	DOCUMENTATION	B	RELIABILITY	B+
EASE OF USE	A-	VISUAL APPEAL	B+	USEFULNESS	B
VENDOR SUPPORT	C	ERROR HANDLING	B	VALUE FOR MONEY	B

If your computer library consists of *Pac-Man* cartridge, and a couple of cassette tapes and/or diskettes, read no further. However, most of us have a substantial and growing collection of diskettes, cassettes, and cartridges, and subsequently the need to find a way to organize all of this to find things quickly. This is the function of *Diskette Librarian*, which catalogs brief descriptions of diskette files, updates entries, searches and sorts specified data fields, and prints out screen displays if you have a printer.

This package organizes your computer software according to the following areas of information:

1. The volume number of the disk, tape, or cartridge.
2. The program or file name.
3. Brief description.
4. The type of software (utility, game, etc).
5. The source of software.
6. The date acquired.
7. The number of disk sectors, or the tape counter.

The system is very user-friendly. It is menu-driven, with up to 3 levels of nested menus, each returning you to the next higher one in the tree when you exit. Error handling is reasonable, though not always 100% clear in specifying exactly what you did wrong (you must check it out and try again). The manual is very well done. Human engineering shines throughout this package. It also uses a machine language sort for speed in sorting your catalog entries. In fact, its speed is satisfactory throughout. Be sure you give volume numbers of Cnnn to your cassette tapes, since it does a CLOAD instead of a LOAD based on this leading character. Also, it prompts you about the starting tape indicator based on the value you stored in "sectors." Disks are identified as Dnnn. Cartridges are suggested as Xnnn. Since you can sort the file on any of the fields (this is very easy, no technical knowledge required at all), you can produce reports of your library by diskette, by alpha name of your file/program, by the type of software, by the source of the software, by the date obtained, and so forth.

Program options include:

1. AUTOCATALOG — this will automatically pull off the volume number of your diskette (or ask you to select one if this has not been done before), and then get the filenames and number of sectors for each file. It will then copy this information to your Librarian database, and ask you to provide description, type, source, and date. All of these data fields are options. This makes the process of creating your original database, and of maintaining it, much easier. When you search a diskette you have previously entered into the library, it will pull off the new entries, and delete any existing entries that you have removed from the diskette since the last run.
2. LIST DIRECTORY — shows you all the files on the disk in Drive #1.
3. ADD NON-DOS — this is used for entering diskettes without a DOS VTOC (i.e., GHOST HUNTER), or for cassettes and cartridges. All fields are optional except the volume number. For cassettes, show the starting footage in the sector variable.
4. INQUIRY/LIST — allows you to specify search criteria, and then examine one complete entry at a time, 19 abbreviated entries at a time, or print the results of the search on a printer.
5. UPDATE — this allows you to modify fields in a record, or to delete entire records.
6. SORT — re-orders the records in your catalog. This is useful to print in some desired order (probably volume number, filename, or type of software).
7. RUN PROGRAM — provides for the direct running of a program on diskette or cassette tape.
8. END SESSION — returns you to BASIC.

You can store over 1,100 entries on a single diskette, and can use more than one diskette for *Librarian* if you need to. If you use the SORT feature, then you will be limited by memory constraints to around 500 entries on a 48K system.

It's an easy and efficient way of getting your software organized, and it's cheap at the price.

DISK DOCTOR

Company: BJ Smartware

Language: BASIC and Machine

Hardware Requirements: 32K

Department: Utilities

Sugg. Retail: \$34.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING
EASE OF USE
VENDOR SUPPORT

A -
A
B +

DOCUMENTATION
VISUAL APPEAL
ERROR HANDLING

A
A
B

RELIABILITY
USEFULNESS
VALUE FOR MONEY

B +
B
A -

Disk Doctor is a multifaceted disk utility designed primarily for the intermediate to advanced Atari user. It compares very favorably with similar products, both in what it can do and the ease with which it operates. It is a powerful tool that can perform radical surgery on your disk; but, used unwisely, it could wreak havoc with files. *Disk Doctor* will allow you to read disk sectors as they are written, and displays the ATASCII translation of bytes within a sector wherever possible. Sectors are read one at a time and may be dumped to a printer, edited, and/or written to disk. The same ability to read, print, edit, and write is provided for the disk directory on DOS formatted disks. You may read and modify the file number, name, starting location, the length of a file, and the DOS flag byte (the last is most useful for recovering files accidentally deleted). When the directory is satisfactory, another program module will automatically repair the sector allocation map to match the current directory.

Additional functions include the ability to trace the sector chains of a DOS file, and a very fast machine language program for the sector-by-sector copy of an entire disk. In addition, there is a bad sector writer and disk RPM checker for copying disks using bad sector copy protection, plus a routine that recovers damaged disks for reuse by patching around the damaged sectors.

If this were all, *Disk Doctor* would be a reasonably good, if not outstanding, disk utility. Three additional functions raise it levels above most of its competition. First is the ability to convert a tokenized, list-protected BASIC program into a listable and modifiable file that can be written to screen, disk, or printer. Next is the built-in disassembler which will disassemble either a DOS or sequential file beginning at any sector/byte location. Since this is a single pass disassembler, branches are not labeled. However, it is possible to label locations, using either your own table of equivalents or the standard Atari mnemonics which come with *Disk Doctor*. This allows you to easily determine when the program is working with player-missiles, color registers, etc. Finally, there is a search routine which will search all or any part of a disk for a sequence of bytes (up to 6 with wildcards).

The program is, with one or two exceptions, extremely user friendly. All of its capabilities work together very well and provide you with a powerful set of tools beyond the normal disk utilities. With these tools you can look at and operate on professional, copy-protected programs, resulting in insightful programming techniques, customized programs, and bug fixes.

Since acquiring *Disk Doctor* I have used it to correct a bug in a heavily list-protected BASIC program. This required repairing the directory, then listing the program, finding the routine I needed to change, and saving the altered copy. All of this was easy except for determining which variables did what. Since list-protected BASIC programs usually clean out the variable name table, the lists produced by *Disk Doctor* have variable names such as V1, V2, etc. This sometimes makes it difficult to determine the function of a variable. In another case, an adventure game had somehow misspelled my character's name through repeated saving. With the help of the search for bytes routine and the sector editor I found and corrected the name. Using the disassembler, I was able to change the sequence of screen colors used in an arcade game. I liked the game, but the colors were bilious; now they are quite pretty.

There are a few weaknesses in the program, but they are relatively minor. On my first attempt to list the BASIC program I debugged, an error statement was returned which in turn crashed the program. I later discovered this was due to the programmer's scrambling of the DOS directory entry, doubtless part of his protection scheme. The sector reader has no provision to automatically step through consecutive sectors or to follow the linked sectors of a DOS file. Instead, each sector must be entered from the menu—another minor annoyance. The fun part of this is that it offers you a good opportunity to apply the *Disk Doctor* to customize itself (unlike some similar programs the *Disk Doctor*, although protected, will copy and list itself using its own utilities).

The manual is excellent, although the program itself is friendly enough to be used without the manual. It includes a good discussion of Atari disk structures, copy protection schemes, and has a small introduction to 6502 assembly language with a few examples of disk boot code. It is not necessary to know assembly to use this program, but it helps.

All in all, *Disk Doctor* is a very valuable addition to your collection of utilities, particularly if you are an advanced BASIC programmer or just learning assembly. There are a number of similar programs available, but they tend to fall into two categories: the sector copiers with bad sector writers for copying certain protected software, and the straight disk utilities for repairing and examining DOS files. *Disk Doctor* combines both. It also provides some additional tools not found in either, and is very friendly as well.

DISKWIZ

Company: Allen Macroware

Language: BASIC and Assembly

Hardware Requirements: 32K

Department: Utilities

Sugg. Retail: \$31.95

Availability: 2

Disk or Tape: Disk

OVERALL RATING **B+**
EASE OF USE **B**
VENDOR SUPPORT **B-**

DOCUMENTATION **B-**
VISUAL APPEAL **N/A**
ERROR HANDLING **B**

RELIABILITY **A**
USEFULNESS **A-**
VALUE FOR MONEY **B+**

Diskwiz is a disk utility program designed to help the user recover files from damaged or unreadable disks. Because it can potentially do as much harm as good, the author recommends that all disks be duplicated before attempting repair. For just this reason he has included a copy program that, unlike DOS, can copy disks on a sector by sector basis regardless of bad sectors. Of course, disks protected by bad sectors won't run unless the duplicate also has bad sectors. This is touched upon only lightly in the documentation.

The utility has numerous information displays to help you determine what has failed. A disk map pinpoints the location by letter of each file on the disk. Bad sectors, duplicate sectors, deleted sectors, and empty or unused sectors are clearly marked. In the case of a duplicate sector problem, a trace can be applied to the sector link found from the Format Directory command on any of the normal directory sectors. This display is toggled from the main display after a sector read, and shows the status flag in addition to the number of sectors in that file. This is helpful if you wish to reinsert a file or correct for duplicate file names.

The main display shows hexadecimal on the left and ASCII character data on the right. Either side can be edited. The cursor is positioned by normal arrow keys, and corrections are accepted as if you were typing on a full screen editor one line at a time. The Return key must be hit after each line is edited. This is a bit cumbersome if there is considerable editing, because the cursor returns to the top of the screen after asking you if you would like to write the altered sector back to the disk. If the user is altering machine language data, a built-in disassembler will help with the chore. Any sector can be disassembled with the link sectors ignored for a multi-sector scan.

The package has a fast string search that will help you locate a particular group of characters (character or hex data) on the disk. It has the ability to move a group of sectors to either another disk, or to another (hopefully) undamaged portion of your present disk. Another command will fix the link sectors to correspond to the new ones. A VTOC command will allow you to automatically update your disk so that DOS doesn't allocate the changes to any new programs written to the disk. Binary headers can also be changed so that machine language files load into the computer at a different address. Finally, *Diskwiz* has a built-in disk speed check.

The program supports Epson, NEC, and Atari printers, and all displays can be sent to the printer. While non-printable characters can be dumped to either the NEC or an Epson equipped with *Graftrax*, those who lack this feature will have no problem printing these characters with the print buffer engaged. Non-printable characters become periods or spaces, and inverted characters become printable characters.

The program's documentation is clear but on the thin side. Experienced users familiar with DOS will have no problem, but beginners should read some of the articles listed in the bibliography. There are also a number of helpful charts in the back of the booklet.

Diskwiz is a very good and comprehensive disk utility. In many ways it is an easier to use disk utility than *Diskey*, but the clear explanations that would have greatly helped beginners tread the fine line of dangerous disk repair are absent.

DISKSCAN

Company: CDY Consulting
Language: BASIC & Machine
Hardware Requirements: 32K

Department: Utilities
Sugg. Retail: \$40.00
Availability: 4
Disk or Tape: Disk*

OVERALL RATING **B+**
EASE OF USE **A**
VENDOR SUPPORT **B-**

DOCUMENTATION **B-**
VISUAL APPEAL **B**
ERROR HANDLING **C+**

RELIABILITY **A**
USEFULNESS **A**
VALUE FOR MONEY **B-**

One of the easiest to use utilities on the market, *DiskScan* possesses all the features needed to scan and repair damaged disks. You can scan entire files sector by sector, attending to or ignoring link sector pointers. The program also includes several Assembly language features like a disassembler and assembler, useful for modifying program code on the disk. The Assembly language support surpasses all other disk utilities that I have seen. Many have a built-in disassembler, but none offers a mini-assembler. Disassembly occurs on the right side of the screen, letting you see the entire sector at a glance. You choose the starting point, and two arrows mark the bytes undergoing the process. If you want to modify a section, you enter Assembly language instructions. This enters the hexadecimal data directly into the sector.

This menu-driven program lets you enter data in decimal, hexadecimal, or character form. The package contains a hex to decimal converter for your convenience. The heart of the program allows reading and modifying individual 128-byte sectors, displayed on the left side of the screen. Unlike other disk utilities, the right side of the screen displays the disassembly of the data rather than character interpretation. Pressing the T-key toggles character data interpretation. You can edit data in either mode, moving the cursor about the screen via the CTRL-arrow keys. The cursor advances to the next byte after each entry. When finished, you can write the sector back to the disk, or to another sector. A search feature lets you locate one or two bytes on the disk, but *DiskScan* cannot map the disk, which although not essential, helps you check for bad files. On the other hand, the disk directory reads automatically, and the display is readable. The program also supports a line printer. All unprintable characters appear as dashes. Another important feature is *DiskScan's* ability to create a DOS binary load file from several sectors of raw non-linked data sectors, a useful ability for those who own an *Omnimon*.

The documentation is adequate and includes a good introduction of the DOS file structure of a standard disk. It explains the directory, the VTOC, and how to format file types, including the extremely important link sector data in each file sector.

CASDUP

Company: IJG, Inc.
Language: Assembly
Hardware Requirements: 16K

Department: Utilities
Sugg. Retail: \$24.95
Availability: 4
Disk or Tape: Tape

OVERALL RATING **B**
EASE OF USE **B**
VENDOR SUPPORT **B**

DOCUMENTATION **C+**
VISUAL APPEAL **N/A**
ERROR HANDLING **B-**

RELIABILITY **A-**
USEFULNESS **A**
VALUE FOR MONEY **A**

At first glance, *Casdup* might appear to be only a cassette duplicating utility. Look again. It lets you copy BASIC program files, data files, "boot files," and "uncopiable" Machine language tapes; helps you recover most of a damaged file with no EOF; converts stop-start file load programs into continuous loading programs; and merges programs from several tapes onto one. It supports single and multiple file programs, continuous and start-stop files, and combinations. The cassette contains two programs: a file oriented and a sector oriented program. The simple operating instructions explain the difference. The sheer variety of options may confuse you, and it may take some experimenting to copy multiple files, but the instructions are clear and the screen prompts help guide you. The hex codes after each file load (for advanced programmers) annoyed me; I thought them useless. The error codes (also in hex) force you to look in the manual. One last problem is the memory. *Casdup* requires 2K of memory, so you cannot copy a tape of more than 14K without encountering complicated multifile load procedures. Despite this, I think the package more than worth the price.

DISKED

Company: Amulet Enterprises
Language: BASIC
Hardware Requirements: 24K

Department: Utilities
Sugg. Retail: \$49.95
Availability: 5
Disk or Tape: Disk

OVERALL RATING **C-**
EASE OF USE **C+**
VENDOR SUPPORT **A-**

DOCUMENTATION **D**
VISUAL APPEAL **C**
ERROR HANDLING **B**

RELIABILITY **B+**
USEFULNESS **C-**
VALUE FOR MONEY **D**

On first view this package appears perfect for ambitious programmers who make a living by writing software. The average home-computer user, however, will find it overpriced, needlessly technical, and not terribly useful.

The 33-page user's manual is a nightmare come to life. The entire volume is single-spaced, with very few headings to help guide you along. As a consequence, a confused reader will slog through pages of featureless type with little help from proper editing. There is no index, and the table of contents is not helpful. The manual reflects a lack of proof-reading. A comprehensive demonstration of various capabilities (which stretches for 15 pages) omits several necessary prompts and describes others in impossibly ambiguous terms.

Many of the functions are trivial. One function renames the DOS Menu options; this seems particularly pointless, since the DOS listings are already concise. Another example shows you how to rename a disk-stored program, and still another demonstrates how specific variables and strings can be changed by directly accessing a particular disk sector. The former can be done with DOS Menu option "E," and the latter is more easily accomplished by simply loading the program and retyping it.

Most users probably don't realize that when they Delete a file using DOS, the file itself remains until it is over-written. Only the menu name and sector count change. *Disked* allows access to the disk directory (sectors 361 to 368), where a few simple commands will replace the menu listing (but *not* update the sector count; that takes a bit more work). Program retrieval is much more useful in a case not described by the manual: the unintentional "loss" of a program due to computer error while the file is being copied or transferred to another disk. Subtracting available sectors from 707 proves the file's still there, but the pointers have been damaged. *Disked* can fix the pointers and get the file back.

You can auto-boot more than one program from the same disk (using the Function keys), and a 6502 Disassembler with virtual addressing (showing where the code actually resides in RAM) proves to be a very handy addition. Also helpful is a sector map that indicates which disk sectors are in use, and the ability to create new directory file names. Most disk software occupies only one-third to one-half of the disk. Copy protection generally prevents the use of the other sectors. By observing the sectors used by the resident program and then naming it, *Disked* allows access to the rest of the disk.

Aside from these features there's really little else of consequence that the program does. At nearly one hundred dollars, the purchaser would be advised to do some comparative shopping.

SPEED-O-DISK

Company: Atari Program Exchange
Language: BASIC
Hardware Requirements: 16K

Department: Utilities
Sugg. Retail: \$17.95
Availability: 9
Disk or Tape: Disk

OVERALL RATING **B**
EASE OF USE **A**
VENDOR SUPPORT **D**

DOCUMENTATION **C**
VISUAL APPEAL **N/A**
ERROR HANDLING **B**

RELIABILITY **C**
USEFULNESS **B**
VALUE FOR MONEY **A**

Speed-O-Disk very conveniently measures and displays the speed of your disk drive in RPM. The documentation tells you how to adjust the drive yourself if the speed is more than four RPM off from the 288 RPM specification. An incorrect speed may cause frequent Error 138's or Error 144's.

There are no surprises following through the simple instructions. Any user with a speed problem should be able to save a week or two of work and a service fee in about ten minutes with *Speed-O-Disk* (but you may want to wait until your warranty expires, since doing the job yourself will void the warranty).

DISKMENU

Company: Atari Program Exchange

Language: BASIC

Hardware Requirements: 16K

Department: Utilities

Sugg. Retail: \$17.95

Availability: 5

Disk or Tape: Disk

OVERALL RATING
EASE OF USE
VENDOR SUPPORT

B-
B
B

DOCUMENTATION
VISUAL APPEAL
ERROR HANDLING

C
B
B

RELIABILITY
USEFULNESS
VALUE FOR MONEY

B
C+
C

DiskMenu is a utility which makes a directory of the programs on your floppy disks. From this directory, one key command can then load or run that program. This utility provides a nice, uncomplicated way to run your programs, especially for young or novice Atari users.

DiskMenu will run both BASIC and assembly language programs. There are, however, certain restrictions. In order to execute properly, the BASIC programs must be in a SAVE format. Assembly language programs, which usually binary load from DOS, cannot use memory locations occupied by the Atari BASIC cartridge or Atari DOS. Hence, not all programs will work properly from *DiskMenu*.

DiskMenu can list up to 47 programs per disk. Within the above-mentioned restrictions, the utility works well and is nicely error trapped. The program can be listed, and hints are given towards customizing it. This allows you to include or exclude common file titles such as DOS.SYS or DUP.SYS on directories.

My only complaint about *DiskMenu* is that it takes up 30 sectors and needs DOS.SYS on your disk. This is very expensive in terms of disk space. In addition, the documentation states that pressing SYSTEM RESET allows you to reboot the directory, but omits to mention that you must type RUN afterwards. This directory reboot works well with BASIC programs, but many assembly language programs will direct SYSTEM RESET elsewhere.

DiskMenu is recommended for its convenience. It eliminates the bother of going back and forth between DOS and BASIC on those disks which have a mixture of BASIC and assembly language programs.

DISK UTILITIES

Company: Educational Software

Language: BASIC

Hardware Requirements: 32K

Department: Utilities

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING
EASE OF USE
VENDOR SUPPORT

A
A
B

DOCUMENTATION
VISUAL APPEAL
ERROR HANDLING

A
B
A-

RELIABILITY
USEFULNESS
VALUE FOR MONEY

B
B
A-

There are a lot of disk utility packages on the market with largely overlapping features. Educational Software's *Disk Utilities* offers a different twist by presenting a disk tutorial in addition to a useful utility package. The following programs are included in the package:

MENU—conveniently selects and runs BASIC programs from disk.

FORMAT—allows single keystroke disk formatting on a production basis.

DISKLIST—prints the disk directory in a format suitable for labeling disk jackets.

AUTOBOOT—creates AUTORUN.SYS files.

INSPECT—displays the contents of any sector or file on a disk.

SPEEDCHECK—displays disk drive speed in RPM.

DISKFILE—demonstrates use of disk files with the Atari.

The utilities perform well, with a few exceptions. MENU expects all LOAD-format BASIC programs to have file names without extenders, nor will it list or run a program name with an extender. INSPECT has no provision for printing the hex, decimal, and ASCII dumps which it displays on the screen in a very readable form. SPEEDCHECK lacks instructions for adjusting drive speeds. The drive speeds themselves have a problem which the documentation points out: the adjustable pots in some disk drives cannot be adjusted—they are sealed and will break when turned.

Disk file programming is one of the more difficult computer skills to learn, and a tutorial on this subject is certainly worthwhile. The *Diskfile* program is written in a very readable style with meaningful variable names and appropriate REMarks. The documentation for *Diskfile* clearly explains the program, including use of IOCB's and

the NOTE and POINT commands. It should be easy to adapt portions of *Diskfile's* code to one's own file handling needs.

The strongest point of this package is its documentation. Educational Software has always produced good documentation, and this ranks with the most readable, hand-holding material I've come across. It also marks a big improvement in proofreading and quality of print for Educational Software. Complete listings of all programs on the disk are an extra educational feature, and all of the program's aspects are clearly and completely explained.

MINI-DOS PLUS

Company: Innovative Design Software

Language: BASIC

Hardware Requirements: 24K

Department: Utilities

Sugg. Retail: \$24.95

Availability: 5

Disk or Tape: Disk

OVERALL RATING **B**
EDUCATIONAL VALUE **B**
VENDOR SUPPORT **B**

EASE OF USE **B-**
DOCUMENTATION **B**
VISUAL APPEAL **C**

ERROR HANDLING **B**
RELIABILITY **B**
VALUE FOR MONEY **A-**

The utility program *Mini-DOS Plus* helps you develop BASIC programs. With this program, you will never have to exit the program you are working on to run an independent utility or go to DOS. *Mini-DOS Plus* becomes part of the program you are working on. It features nine of the fifteen DOS functions: List Directory, Go to BASIC Delete Files, Rename Files, Lock Files, Unlock Files, Format Disk, Binary Load, and Create MEM.SAV. These functions work about the same as those in DOS. The ten additional functions save time. One of these, the List Variables function, displays a list of all the variables used in the program. If you run out of variable names, you can use this function to purge unused or misspelled variables.

You can quickly delete blocks of lines with the Delete Lines function. Once you have completed (or nearly completed) your program, you can delete the *Mini-DOS* utility from the main program through the Delete *Mini-DOS* function.

I found two of the functions of particular interest: Four-Color GR.0 and Check Sounds. While in Four-Color GR.0, you can create striking, colorful graphic displays on a black background. You redefine character sets to display interesting shapes and colors with one touch of the CTRL key and a letter key. The disk contains an attractive demonstration of some of the possible designs. You can also experiment with sound effects while in the Check Sounds mode. Moving the joystick changes sound, volume, pitch, and distortion while their values appear on the screen.

Advanced programmers will appreciate the program's ability to convert hexadecimals to decimals and vice versa. *Mini-DOS Plus* can also give a hex-dump of any file on the disk, or display a hex-dump of any memory location.

Two minor weaknesses detract from this utility. It lacks the ability to re-number lines, and the documentation lacks clarity. In fact, one of the short program listings contains a typographical error. However, if you study the documentation slowly and carefully, you will find it helpful. *Mini-DOS Plus* is a good program overall, and I recommend it.

TACH MASTER

Company: Swiftly Software

Language: BASIC

Hardware Requirements: 16K, disk drive.

Department: Utilities

Sugg. Retail: \$29.95

Availability: 4

Disk or Tape: Disk

OVERALL RATING **A-**
EASE OF USE **A-**
VENDOR SUPPORT **B-**

DOCUMENTATION **B**
VISUAL APPEAL **B-**
ERROR HANDLING **A**

RELIABILITY **A**
USEFULNESS **A-**
VALUE FOR MONEY **B+**

Tach Master is a utility for testing and adjusting the speed of your Atari 810 disk drive. Since disk speed is critical in reading and writing data, and the 810 drive is not noted for its ruggedness or stability, it is quite likely that your drive will need adjustment from time to time. *Tach Master* does this quickly, easily, and accurately using any formatted disk. Its accuracy is to 1/4 RPM, and it updates the graphical display 5 times a second.

Adjusting the drive requires taking off the cover and turning the speed potentiometer located on the board at the left rear of the unit with a screwdriver. This is shown very clearly in the documentation. Optimum speed is highlighted on the speed display. The utility supports any of four connected drives. While there have been numerous public domain disk speed programs, this is by far the most accurate.

Communications

TELE TARI

Company: Don't Ask Software
Language: BASIC & Machine
Hardware Requirements: 32K, [48K recommended]

Department: Utilities
Sugg. Retail: \$39.95
Availability: 8
Disk or Tape: Disk

OVERALL RATING **A+**
EASE OF USE **A+**
VENDOR SUPPORT **B**

DOCUMENTATION **B+**
VISUAL APPEAL **B+**
ERROR HANDLING **A**

RELIABILITY **A**
USEFULNESS **A-**
VALUE FOR MONEY **A**

Tele Tari is the most "user friendly" telecommunications program around. First, it is totally menu driven, and so can be used by a rank novice who bought his computer yesterday. Second, its ability to control any parameter on the Atari 850 interface allows you to communicate with any outside device or computer that is compatible with the RS-232. Thus, it can be used to interface your Atari 800 with a laser disc, or to control machine tools.

Tele Tari automatically supplies a 20K buffer on 48K machines for uploading or downloading data to and from another computer. When the buffer has less than 1,000 bytes left, the screen border indicated this by turning red. Once a buffer has data in it, either from your own disk drive or from data received via the RS-232 port, it can be reviewed in all or part, printed, sent out the port (uploaded), or saved to disk. Data that is being reviewed can be quickly scanned, using the arrow keys to advance or backtrack by 500 bytes at a time. Parts or all of the buffer can be output to your line printer. If the printer has a large buffer, you could dump the entire buffer to the printer and return to the On Line mode while the printer was printing the file.

All parameters used by the Atari 850 Interface Module can be set and controlled by *Tele Tari*. These sixteen parameters include baud rate, word size, stop bits, control lines, input/output parity, line feed, hand shaking, etc. For example, the baud rate can vary between 0 and 9,600. You can store 10 full sets of user defined parameters per user disk.

This utility will work with any regular or smart modem. Modem commands for using a smart modem can be entered directly while using the program. And for those who have plans to install an 80-column card, *Tele Tari* supports the BIT 3 card. It also supports two disk drives. It is totally error trapped, and, for example, will detect whether or not the 850 interface is off. In sum, this communications package is the most versatile and the best available package currently on the market.

DATALINK

Company: Swift Software
Language: Atari BASIC
Hardware Requirements: 24K, disk drive.

Department: Utilities
Sugg. Retail: \$39.95
Availability: 7
Disk or Tape: Disk

OVERALL RATING **B**
EASE OF USE **B**
VENDOR SUPPORT **C+**

DOCUMENTATION **B**
VALUE FOR MONEY **B**
VISUAL APPEAL **C**

RELIABILITY **A**
ERROR HANDLING **A/C**

Datalink is a telecommunications program that offers several advantages when compared with the Atari *Telelink* I computer program. *Datalink* has a large internal buffer that depends on the amount of memory in your computer. The data from the telecommunications fills this buffer. You can save the data to disk, print the data on the screen, or print the data on a printer after you hang up the phone. This saves you time and connection charges. The program will work with any 300 baud modem that uses Port 1 of the Atari 850 Interface Module. *Datalink* will also send and receive both text and binary files in ASCII or ATASCII format.

The program is essentially menu driven. The main menu contains the primary functions. These are: Terminal, Send Program, Receive Program, Screen Dump, and Printer Dump. The function is selected by moving a pointer using the Select key then pressing the Start key to begin the function. The term Screen Dump does not have the standard microcomputer meaning. The *Datalink* Screen Dump prints the contents of the buffer to the screen, rather than printing the screen image on a printer in the conventional sense of the term.

The program is generally easy to use. The function keys enter commands when the menu isn't on the screen. As with most programs using these keys, you must remember the different functions for the keys in the different program modes. Some confusion arises because you do not always return to the main menu in the same way. Sometimes you press SELECT, sometimes RETURN, and sometimes BREAK followed by SELECT. Reentering the Terminal mode from the menu automatically clears the buffer. This can be annoying because you must exit the terminal mode to print the buffer on the screen. When you return to the Terminal mode, *Datalink* begins to

overwrite the data in the buffer. Old data is left in the buffer. What's not overwritten can be printed to the screen, but it cannot be printed on the printer. You must be very careful not to press the wrong key at the wrong time. The program seems to be well protected against input errors, but not against human error. For instance, pressing the START key erases the buffer. Also, pressing one key to exit the Terminal will erase the buffer as well.

The manual describes the function of the program very well, but it does not describe the myriad of problems that can confront a person trying to use a "nonstandard" telecommunications system. Most of the functions available from the Atari 850 Interface Module are set to default values by *Datalink*. For example, it is not clear if baud rates slower than 300 can be used for older teletype printers.

The program is a significant improvement over *Teletalk I*, and is recommended for simple telecommunications applications.

TELE-TALK

Company: Datasoft

Language: Assembly

Hardware Requirements: 32K, 850 Interface Modem

Department: Utilities

Sugg. Retail: \$49.95

Availability: 4

Disk or Tape: Disk

OVERALL RATING
EASE OF USE
VENDOR SUPPORT

A-
B+
B

DOCUMENTATION
VISUAL APPEAL
ERROR HANDLING

A
A
A

RELIABILITY
USEFULNESS
VALUE FOR MONEY

A
A
B

Fabio Ehrenguber's *Tele-Talk* is an easy to use, polished, and flexible communications package. This menu driven program is well suited to the novice on-liner and to seasoned tinkerers with the RS-232C.

For the novice, hooking up to another computer is as easy as readying your modem, booting up the program, and telephoning the other system. The default values in the program access most bulletin boards. For those who need to change port configurations (such as the port number, baud rate, stop bits, CRX/CTS/DSR checks, parity check, auto line feed, duplex type, word wrap, RTS/DTR/XMT/Xon/Xoff parameters, screen width (38 or 40), or text save features), select the modify option of the main menu. This choice displays each parameter and its present value; the arrow keys switch and change the parameters. After modification, you can save your custom parameter set and install it as the new default values. This flexibility allows two users of the program to verify their transmissions block by block, while transmitting.

The START key toggles between the terminal mode and the command menu, and the terminal mode has several features not found in other communication packages. A line indicator moves across the top of the terminal display to indicate the remaining capacity of the text buffer. When the indicator reaches the right side of the screen, the buffer is full. Continuous displays of both present and elapsed time, and total connect charges are also included. The elapsed time indicator and present charges can be easily reset in the terminal mode. This is especially appreciated during lengthy or costly telephone sessions.

In addition, the terminal mode exhibits a split screen mode in which the top twenty lines show the terminal transmission while the bottom three lines are reserved for user input. This saves time and connect costs since you can input and edit your next command when the other computer is busy. Both the split screen feature and the time functions can be toggled on or off. Other niceties of the terminal mode include an attractive custom display, the ability to change the color of the display, and a clear screen option. The program is easy to use throughout.

Back at the command menu, other options allow you to manipulate the contents of the buffer and disk. The buffer contains all transmissions, and you can save its contents to your disk drive, the screen, or a printer. You can read it (use space bar as pause), or you can load a program into the buffer and send it to another computer. The disk functions allow you to easily delete, rename, lock/unlock files, or take disk directories.

One noteworthy feature is the menu option which allows you to store up to ten 32-character strings to be transmitted with a single key stroke. This is especially useful in sending passwords, your name and address, or in automatic dialing with a smart modem. You cannot save strings, however, and they must be re-entered at every boot up. They are also recalled by a single digit mnemonic when in the terminal mode.

Another minor inconvenience of *Tele-Talk*'s terminal mode is the inability to translate ATASCII transmissions from one Atari to another. While BASIC files are easily transferred in the terminal mode, Atari binary programs must be uploaded and downloaded using separate options in the command menu.

Tele-Talk, finally, is highly recommended to all users considering adding telecommunications to their computer. This program performs flawlessly and is a joy to use (unlike many similar programs). Attractive, well documented, and programed with insight, it is worth the price.

Character Set & Player Missile Editors

pm ANIMATOR

Company: Don't Ask Software

Language: BASIC & Machine

Hardware Requirements: 32K

Department: Utilities

Sugg. Retail: \$34.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING **B+**
EASE OF USE **C**
VENDOR SUPPORT **B**

DOCUMENTATION **B+**
VISUAL APPEAL **B+**
ERROR HANDLING **B**

RELIABILITY **A**
USEFULNESS **B**
VALUE FOR MONEY **B+**

pm Animator is an animation package that will allow the BASIC language programmer to incorporate player-missile graphics animation into a program. The machine language subroutines provided can be accessed through simple USR calls.

The Grafix Editor permits you to create player-missile graphic images eight pixels wide by sixteen deep. Each of these graphic images can be slightly different from the previous one, so that in the end an animated sequence is created. The editor makes this job easy. First, an exploded view allows you to create a player pixel by pixel, using either a joystick-controller or the keyboard's arrow keys. Next, three view windows hold the current working images, letting you compare the differences between the frames. Any frame in a working file can be loaded into these three windows and then modified through the enlarged editing window. Additional commands allow images to be copied to other frames, impose one frame over another to form multi-colored players, and to view the actual hexadecimal or decimal data that makes up a player. The animation command can animate the sequence in any order, any number of times, at any speed. The editor is very easy to use, but I do have one complaint. Although you can determine which frame is in each of the windows, there is no indicator to distinguish between frames in case you forget.

The File Editor allows you to create a custom file. Frames from different files can be loaded into specific columns and rows of the grid. You can load part of a file starting at a specific frame. Once in the File Editor, these frames can be duplicated or simply rearranged and saved as a unique sequence of animation frames to be used later in a BASIC program.

pm Animator comes with an extensive tutorial and several good demonstration programs. All of these programs are unprotected and listable. The *pm Animator* is itself protected, but is used only for creating the image file. The tutorial is ample, fairly clear, yet novice programmers will still find the material difficult to digest, let alone implement. This package is a definite step forward in making player-missile graphics easier to use, but won't substitute for a lack of programming ability or imagination.

INSTEDIT, Rev.2.

Company: Atari Program Exchange

Language: Atari BASIC

Hardware Requirements: 16K, tape; 24K, disk and joystick.

Department: Utilities

Sugg. Retail: \$24.95

Availability: 9

Disk or Tape: Both

OVERALL RATING **B**
EASE OF USE **B+**
VENDOR SUPPORT **C**

DOCUMENTATION **B**
VISUAL APPEAL **B+**
ERROR HANDLING **B**

RELIABILITY **A-**
USEFULNESS **B**
VALUE FOR MONEY **B+**

Instedit is a character set generator. With it, you can create custom character sets very easily, including the code to automatically include them in your programs (BASIC or Assembler). You can also design player-missile graphics characters for your applications.

Excellent attention has been paid to visual appeal and people-friendly features in this application package. A large scale version of the character you are modifying is displayed on center screen, as well as the entire character set you are working on, in a window immediately below. Below that is the character you are working on in Graphics modes 0, 1, and 2, as well as O.S. modes 3, 4, and 5. Also on the screen are a Main menu and an Edit menu. Not only

is this program menu-driven, it gives you prompts to guide you along. The actual character editing is done with the joystick and fire button, making it simple to create your own special shapes, graphics, and text characters.

You may save or load a custom character set, write special statements from the program to be used as ".BYTE" statements in Assembler, "Data" statements in BASIC, or a complete subroutine for BASIC to recreate your special characters. Within the Edit phase, you can revert to the Atari standard character, the shape you originally loaded for this character from a previous "Save" file, copy over the shape of any other character in your custom set, invert the character, mirror image it, rotate it 90 degrees, or blank it out to start over. You can also go into a special mode that lets you type a series of your custom characters in any one of the 6 text modes on the Atari, in order to examine their appearance.

At the back of the User Manual, several good hints are provided, including text on Graphics 8 screens, and the use of artifacting on your video monitor. The manual also gives insight into the program's workings, and Atari's 3 special character modes, and concludes with a good set of bibliographic references.

If you do games, custom graphics, or special text applications, take a close look at this utility.

GRAPHIC GENERATOR

Company: Datasoft

Language: BASIC

Hardware Requirements: 32K, disk drive.

Department: Utilities

Sugg. Retail: \$24.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING

A

EASE OF USE

B +

VENDOR SUPPORT

B

DOCUMENTATION

B +

VISUAL APPEAL

B +

ERROR HANDLING

A -

RELIABILITY

A

USEFULNESS

A

VALUE FOR MONEY

A

Graphic Generator is a powerful, comprehensive utility package that edits character sets in BASIC and machine language programs. Character set graphics are often used in animation when more than five objects need to be moved around the screen simultaneously; or when objects need to change shape during animation as, for example, when a horse gallops. Obviously, a utility package capable of modifying the existing Atari character set, or creating new sets from scratch, can be a very useful item indeed.

This utility is entirely menu driven. Characters can be edited as individual units, or as part of matrices. A matrix is a group of characters forming a larger image. These can be so many characters wide by so many deep. The characters making up the matrix are chosen before editing. The editing process itself is done on an enlarged grid in any of six Antic graphic modes. This includes modes 4 & 5, which contain four color modes.

When editing in color, the color register is chosen with the option key. The colors in these registers can be changed, in turn, by using the color palette option in the program. The editing itself is done by moving a joystick and pressing the button when you want to draw pixels, or by moving and holding down the shift arrow keys to draw.

Many features have been incorporated into the edit mode which conveniently allow you to produce a large number of characters. You can do single pixel shifts up, down, left or right, without having to recreate the character; or you can produce a mirror image (left or right) of the character. You can view an entire character set, or just the matrix of characters as they would appear in actual size and color on the screen. There is also a merge option that allows you to move characters within the character set, or even to another set. Because as many as five sets can be loaded using a 48K Atari (only one with 32K), you must "steal" characters from other character sets.

Although the disk is protected, all character sets are loaded and saved using normal DOS files. Thus, created character sets can easily be used in one's own programs. The author has also included several demonstrations of character set animation in BASIC that can be listed. *Graphic Generator* is an excellent program, easy to use and clearly documented.

Graphics Packages

3-D SUPERGRAPHICS & COLOR GAME DEVELOPMENT SYSTEM

Company: United Software of America

Language: Machine

Hardware Requirements: 40K; disk drive or cassette player.

Department: Utilities

Sugg. Retail: \$39.95

Availability: 6

Disk or Tape: Both

OVERALL RATING **C-**
EASE OF USE **C-**
VENDOR SUPPORT **C-**

DOCUMENTATION **D**
VISUAL APPEAL **C**
ERROR HANDLING **B**

RELIABILITY **B+**
USEFULNESS **B**
VALUE FOR MONEY **C**

The 3-D *Supergraphics* package, by Paul Lutus, is a tool for animating games or demonstration programs. It allows you to define 3-dimensional shapes, either in black and white or in three Hi-Res colors (blue, green, and white). You can move these objects around the screen, rotate them about their X, Y or Z axes, change the overall scale, or stretch the shape by scaling the axis unequally. Supplementary text can be placed anywhere on the Hi-Res display in any scale or color.

The machine language algorithm for rotating objects using matrix transformations is quite fast. The technique of ping-ponging between two graphics screens provides flicker-free animation. Because of the extra calculations required during color display, the animation frame rate for large databases tends to slow down considerably. Lutus provides two versions of the program. The one in black and white is for faster framing. The color version is definitely slower, especially as normally interfaced in BASIC. Lutus does gain some speed by providing commands for executing loops within his code rather than the distinctively slow FOR-NEXT loop command. As usual, you have to be particularly careful with an object near the edge of the screen. This package has no line clipping; therefore, objects tend to wrap around near the screen's edge. And for those users who need missile algorithms, there are none. You must also be aware that the package places 3-dimensional objects on a 2-dimensional screen. There is no Z-axis. The effect of objects moving away from the viewer is entirely accomplished by scaling.

Lutus includes a graphics editor (GRFBAS) for entering values for the data base. It is not a very good editor, but it is easy to use and beats calculating values by hand. It also allows you to view and save your data files.

To use *Supergraphics*, you must first load it into memory by using the DOS command "L." You enable it with X#USR (22016), and must open a control block for input/output to the device "G." "G" will activate the statement OPEN #1, 12, 0. *Supergraphics* must then be allowed to control all text printing and graphics through the channel open to "G." Commands take the following form:

PRINT #1; "% ND, NW, SH28736, SC5"

PRINT #1; "% PX10, PY52, RYOTZOSZ

which simply says: "Draw a new shape starting in memory location 28736, scaled to 5, position it at X # 10, Y # 52, and rotate around the axis from 0 to 20 stepping Z." It may throw beginners at first, but it can be learned.

The documentation comprises a 44-page bound booklet that has been completely rewritten for Atari users. Although difficult to understand until read through several times, it is thorough. It offers a competent discussion on a very confusing topic: that is, the difference between objects that are moved in translation, versus those moved by position. It contains several examples, finally, that help to make a language or system with difficult notation more understandable.

The disk is unprotected, so if you want to use the package in your own program, simply load the graphics package from the disk or cassette. However, if you want to incorporate the package into a commercial program, you will have to arrange for a royalty-use fee with United Software.

This package has applications for game programmers, especially if they prefer to try a 3-D game. However, the program is more difficult to understand and apply to your own game than would first appear.

PAINT

Company: Reston Publishing Co.

Language: Machine Language

Hardware Requirements: 48K, disk drive.

Department: Utilities

Sugg. Retail: \$39.95

Availability: 4

Disk or Tape: Disk

OVERALL RATING	A +	DOCUMENTATION	A	RELIABILITY	A
EASE OF USE	A +	VISUAL APPEAL	A	USEFULNESS	A -
VENDOR SUPPORT	B	ERROR HANDLING	A	VALUE FOR MONEY	A

Paint is a remarkable drawing program developed by the staff of the Capital Children's Museum in Washington, D.C. It allows both the child and adult to explore some of the rich possibilities of artistic expression on the home computer. What is best about the program is that it is entirely menu driven, by either joystick control or simple one letter keyboard commands. The mnemonics are easy to remember; for example, Z for zoom; E for erase; P for paint; R for rectangle; and M for mix colors.

There are actually two drawing programs on the disk. First, *Paint* is a simplified version of *Super Paint*, and is primarily for young children. Four paint pots and five brush sizes are arranged at the bottom of the drawing screen. The joystick, which can be moved around the screen to draw, can also be moved to one of the paint pots and dipped in. Pressing the joystick once activates the color in the paint pot, indicated by a line beneath the pot. This furnishes an inexhaustible supply of paint as the brush is moved around the screen. It can be positioned anywhere, and draws only when the joystick button is depressed. Likewise, the size of the brush can be varied by moving the joystick cursor to the appropriate brush size. The colors (one background and three foreground) can be changed by dipping the cursor brush into the different paint pots, pressing the button twice until it blinks, then moving the joystick up or down until you obtain the desired color. Since there can only be four colors on the screen at any one time, changing the color in a pot alters all lines or splotches made in the previous color. If you need to erase your drawing, simply move the cursor to the E block on the screen and the picture erases.

The second program, *Super Paint*, is a much more versatile version, allowing the created picture to be saved to disk and displayed later in an art show or slide show presentation. It can draw circles, lines, and rectangles, paint with textured splashes of color, and paint with brushes that give the leading edge different profiles. By using the Zoom function (which can magnify a portion of the picture four or sixteen times), you can work in very high detail while also changing single-screen color pixels.

The color/texture menu mode, which allows you to blend the shades and hues in your palette, is one of the most fascinating features of the entire program. Both the color and luminance can be varied with the joystick. A sixteen color band, and a band showing the eight luminances of the chosen color, are displayed on the left portion of the screen. A movable bar connects the two settings, and indicates exactly where you are on the chart. When the colors are changed, you will notice that the picture looks quite different both in color and shape. It is an effect that artists spent years exploring, and one that you can now achieve in a matter of moments.

The textured menu controls the five additional paint pots at the bottom of the drawing screen. The large, variably-textured mosaic screen area has a seemingly endless variety. As the cursor is moved, a magnified portion is displayed at the top of the screen. When a texture is picked, it appears in the paint pot. This mosaic pattern will be repeated along any line you trace with a brush dipped into its "color." The effect is impressionistic — much like that of the artist Seurat's paintings.

Although any portion of the menu can be reached and controlled by joystick, it is often easier to use keyboard commands to achieve the same effect. For example, if you choose to draw a circle, press the O key (sorry, C was already used to designate "color," so O was chosen because it resembles a circle). Move the joystick cursor to the center, press the button, then move the cursor to the outside and press again. Voila! A circle appears as round and true as if you had used a compass. To return to regular drawing, press P for paint.

The documentation is very easy to read, breezy, and light in tone. It was apparently written to disarm those who are frightened or intimidated by computers. The 100 + page manual also contains a brief history of art, and several additional profiles of computer artists.

Paint is a first rate package for any would-be computer artist. It allows the child as well as the adult to explore the visual potential of small computers, and enhances the creative process.

MICRO PAINTER

Company: Datsoft

Language: Machine

Hardware Requirements: 48K, disk drive.

Department: Utilities

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING **A -**
EASE OF USE **A -**
VENDOR SUPPORT **B**

DOCUMENTATION **B +**
VISUAL APPEAL **B +**
ERROR HANDLING **A**

RELIABILITY **A**
USEFULNESS **B**
VALUE FOR MONEY **B**

Micro Painter, by Bob Bishop, is a graphics package that lets you design original drawings and then paint them in, much like an electronic coloring book. The diskette comes with nine practice drawings for you to color.

The joystick controlled cursor can be toggled into three different drawing modes using the Select key. There are fill, draw, and line modes. Each has a differently shaped cursor, and the mode is displayed with a big letter in the upper left corner. The draw mode is much like any other drawing package. Color can be selected from one of the four paint pots at the top of the screen. The cursor is guided around the screen, and it leaves a trail of colored dots when the button is depressed. The line mode is the rubberband type: essentially you can preview the new line as you move the cursor around. When you want the line to be permanent, you press the button.

The coloring book or fill mode is the most fun to work with. You can choose a single solid color, or two different colors blended in either a checkered pattern, or one with horizontal or vertical stripes. This gives you many shades of color in addition to the four solid colors. These four solid colors can be changed much as in SETCOLOR. Once a pot has been picked by keyboard command, the color can be changed in hue and luminance using either the joystick controller or the four arrow keys. When you change the color in a pot, any color in your drawing that used that color also changes. It is easy to fill an area defined by the boundary line of another color. You choose your color, then place your cursor in the area to be colored and press the button. The "fill" begins as a small diamond and expands to fill the area. If it looks like you made a mistake you can either stop it with the Break key, or press the U key which will erase the last fill or all lines since the last fill. A part of the screen that has been painted can remain, if you press the Atari key.

The most useful feature of the program is the microscope mode, where a portion of the picture is enlarged. This section, which shows only a 48 wide by 48 high dot area, is toggled on and off with the space bar. It can be used for repairing small areas of your picture. You can easily move the cursor by single pixels and draw single colored dots by pressing the joystick button.

The Option key will place you in the main program menu. From here, any picture can be loaded or saved to disk. These pictures could even be printed to the line printer if you purchase their companion program, *Color Print*. The documentation seems to be written for the novice. It uses the step-by-step approach to guide the user through a sample session. The documentation is very good, but has one potentially troublesome error. During the session they ask you to load a picture named MICRO-MAN. It can't be done with the hyphen; and, if the user catalogs the disk, he will discover that it has no hyphen.

Micro Painter, in sum, is a very entertaining program for budding artists of all ages. While it produces drawings more suited to the "coloring book" approach to art, it is indeed a well designed product.

FUN WITH ART

Company: EPYX

Language: Machine

Hardware Requirements: 32K

Department: Utilities

Sugg. Retail: \$40.00

Availability: 6

Disk or Tape: Cartridge

OVERALL RATING **A +**
EASE OF USE **A +**
VENDOR SUPPORT **B**

DOCUMENTATION **B**
VISUAL APPEAL **A**
ERROR HANDLING **A**

RELIABILITY **A**
USEFULNESS **A +**
VALUE FOR MONEY **A**

Fun With Art, although a very sophisticated drawing package and graphics program, is simple enough for even a first-time computer owner to use. It is chock-full of advanced features rarely found on such an inexpensive and easy-to-use drawing program.

What makes the program simple and fun to use is its joystick operated graphics menu. All of the program's functions are shown by symbols. As the joystick-controlled cursor moves across each symbol, its function is displayed in the text window. Then, you select the function with the joystick button. The START-key shifts the view to the graphics 7 1/2 screen. This graphics mode, ANTIC E, is a four color mode with a resolution of 160 pixels horizontally by 196 pixels vertically. Essentially, it has twice the resolution of Graphics Mode 7. Its screen memory requires 7,696 bytes.

The cartridge has a number of drawing modes. You can draw with any color register and with a selected brush size by holding the trigger down and moving the joystick around the screen. Straight lines are the easiest. You mark one

end at the selected position by pressing the trigger, and then move the joystick cursor to the other end and press again. You connect the line segment by pressing a third time. A box can be quickly drawn by placing marker points at its two diagonal corners and then pressing the button a third time. Likewise, circles are formed by placing a marker at the center and a second marker along its arc. A perfect circle rapidly appears by pressing the trigger once again. (You can't draw an arc, but you can transfer part of the circle in a block move operation.)

The block move functions are powerful features. You can move a selected block on the screen, copy it, copy it upside down, or copy it mirrored from left to right. Selecting the area to be moved is much like outlining a box. Markers are placed at the two opposite ends. At this point if you don't like the size you can press START to begin anew. Then you move your joystick. A duplicate window and set of markers moves around the screen. Once you have chosen a new site, pressing the button completes the transfer.

There are a number of fill commands available. You can fill in areas in either the left, right, up, or down directions. The area will fill-in in the selected direction until a blocking or non-background pixel is encountered. The fill continues in the selected direction as you move your cursor along the other axis.

In case of a mistake there is a block zoom function that magnifies the pixels in a small area. Thus, individual pixels may be corrected. Correction is a slow process, but it gives you total control. Another feature lets you change the color of any section of the picture. This is a handy feature since all pixels are indirectly referenced by color registers. You should note that when colors change in one of the four color registers all existing pixels in that color will also change. This color swap feature swaps the color register references to the pixels in the specified block. Last but not least, text can be added anywhere on the screen in either small or large font.

Pictures can, of course, be saved to disk for use in another program or for later editing. A supplementary page of documentation gives several BASIC listing subroutines that will allow you to incorporate these pictures in your programs. These lines change the display list, set the display list interrupts, and load the screens.

Fun With Art is one of the easiest to use and most useful programs available for both budding artists and those who need to design elaborate and professionally titled screens for use within their programs. It also has a great many features and the finest four-color resolution available in a graphics program today.

GRAPHICS COMPOSER

Company: Versa Computing

Language: BASIC

Hardware Requirements: 32K; cassette player or disk drive.

Department: Utilities

Sugg. Retail: \$39.95

Availability: 6

Disk or Tape: Both

OVERALL RATING **B+**

EASE OF USE **B+**

VENDOR SUPPORT **B**

DOCUMENTATION **B-**

VISUAL APPEAL **B+**

ERROR HANDLING **A-**

RELIABILITY **A-**

USEFULNESS **B+**

VALUE FOR MONEY **B**

Graphics Composer is a very comprehensive graphics package for creating medium resolution (GR.7) or High Resolution (GR.8) screens which can be saved to cassette or disk for later use in a program. The program is very versatile in that geometric figures can easily be created, colors filled in, and text added (Hi-Res mode only). In many ways it closely resembles the software available with the *Versa Writer Tablet*, at a fraction of the cost.

The normal drawing mode consists of a dot cursor that can be moved around the screen by joystick without damaging the existing image. This is a multi-speed cursor in that when it first moves it does so very slowly but gradually speeds up. This allows rapid access to different portions of the screen while allowing very detailed work. When the joystick button is depressed, the cursor enters the drawing mode and leaves a trail of colored dots in the chosen color. Colors can be varied, as in SETCOLOR. You must remember that you have little control of color in the Hi-Res mode, and that colors are determined by "artifactual." The space bar allows straight lines to be drawn quickly from the last plotted point to the current one. There are several different brush modes, and you can even draw with an airbrush effect to produce shading. Airbrushing requires considerable practice, however.

Two other programs can be called from the draw mode in the disk-based version. (Cassette owners will have to save their drawings first, then load the other programs.) *Geo Maker* allows geometric shapes to be quickly drawn. These include circles, rectangles, triangles, parallelograms, arcs between any three points, and a polygon of any number of sides. The text mode program will allow you to write standard sized text to the Hi-Res screen. It allows you to load your particular font.

One interesting feature is the ability to form player missile shapes from portions of the Hi-Res screen. This is more useful for duplicating narrow screen shapes on the screen than for actually producing player shapes usable in other programs. However, there is a separate utility that shows a microscopic view of the player, allowing you to modify single pixels. The data is actually saved as data statements.

The package does a nice job of creating professional looking screens in the two highest resolution graphics modes. It seems to be a little bit slow since it is written in BASIC, but this shouldn't detract from the package. The documentation is clear, except in the area of the form and in the use of created player missile data.

ATARI WORLD

Company: United Software of America

Language: Assembly

Hardware Requirements: 40K

Department: Utilities

Sugg. Retail: \$59.95

Availability: 6

Disk or Tape: Disk*

OVERALL RATING **C+**
EASE OF USE **C**
VENDOR SUPPORT **C-**

DOCUMENTATION **C**
VISUAL APPEAL **B**
ERROR HANDLING **B**

RELIABILITY **A-**
USEFULNESS **C+**
VALUE FOR MONEY **C**

Atari World is a three-dimensional graphics package especially useful in architectural design and for animation. The package is capable of showing three-dimensional objects in a predetermined series of moves specified in advance by the user. The boundaries of this system is a cube about 64,000 units on a side.

The program is relatively easy to use, as it virtually has a text editor that makes entering data simple; and the program avoids forcing you to understand any technical aspects. Data is entered by specifying a start point for the object in X,Y, and Z coordinates, then a point to continue that line in relationship to the previous point (e.g., +100X, -10Y). Any of three colors can be chosen. Once an object is completed and entered, one can view it by specifying a scale, a viewing position, plus angles (both horizontal and vertical) to point the viewfinder at the object.

Created objects can be saved for later animation, or can be used as basic building blocks for more complicated objects (e.g., chairs in a conference room). One can also save at any time the current view on the screen.

The program has a number of demonstrations that show the full potential of the package. The thirty-two page instruction booklet has been rewritten especially for the Atari. While the content and style isn't the clearest, it is adequate, and includes several examples.

Atari World's main disadvantages are that the program lacks Real Time interactive control, such as an interface with the paddles or joystick for game animation, and, as the number of projected lines increases, the animation speed bogs down (speed is approx. 100 lines or points/sec). However, it is very useful for examining complex objects from different angles or points of view.

GTIA DRAW

Company: Sar-An Computer Products

Language: Machine

Hardware Requirements: 48K

Department: Graphics

Sugg. Retail: \$49.95

Availability: 2

Disk or Tape: Cartridge

OVERALL RATING **C**
EASE OF USE **C**
VENDOR SUPPORT **C+**

DOCUMENTATION **C-**
VISUAL APPEAL **A-**
ERROR HANDLING **D**

RELIABILITY **C**
USEFULNESS **C**
VALUE FOR MONEY **D**

GTIA Draw is designed for those who want to draw pictures, graphs, and charts using the Atari's graphic capabilities, but who do not want to learn all the drawing commands in BASIC. Graphics programs created with this program can be loaded and saved onto a cassette or disk using standard DOS.

You have three graphics modes to choose from—9, 10, and 11. These modes have the same characteristics and function the same way as they do in Atari BASIC. Plotting, drawing, and set-color modes also add to the program's capabilities. The most common way to draw images on the screen is to move the cursor with the joystick and press the fire button as the cursor moves. The character mode enables you to draw characters or redefine them.

The documentation is a problem. It is nothing more than a reference book, and does not contain clear, step-by-step instructions. The only way to learn how to use the program effectively is through experimentation. (Ironically, the time spent in experimenting with this program could be better spent learning how to draw in BASIC.) In addition, the large number of commands in the program are sometimes confusing. Fortunately, the designers have included a mailing address for those who have any questions about the program.

A more serious problem is that the graphics created with *SGTIA Draw* cannot become part of a BASIC program. They merely stand by themselves. This is fine for those who simply want to create graphs and charts. But for those who want to write BASIC programs with colorful graphics, *GTIA Draw* is a disappointment.

GRAPHIC MASTER

Company: Datasoft
Language: Assembly
Hardware Requirements: 40K

Department: Utilities
Sugg. Retail: \$34.95
Availability: 5
Disk or Tape: Disk

OVERALL RATING **B-**
EASE OF USE **C+**
VENDOR SUPPORT **B-**

DOCUMENTATION **C**
VISUAL APPEAL **B**
ERROR HANDLING **B**

RELIABILITY **B+**
USEFULNESS **C+**
VALUE FOR MONEY **C+**

Graphic Master allows you to easily create professional looking graphics mode eight displays (320 pixels by 192 pixels). The heart of the system is a double screen working area which allows the user one screen as a scratch pad, and the other for finished work. With the ability to transfer sections of the working screen via a variable size window to the second screen, there is less likelihood of ruining your work of art.

There are basically three working modes to this program. A drawing mode enables you to use a joystick to make Hi-Res drawings on the screen. Various sub commands make drawing straight lines, circles, and polygons easy. The text mode allows the addition of three sizes of text letters to the drawing. While the larger sizes can be in color, you are limited to the two-color anti-aliasing in graphics mode eight. This is true of any of your drawings.

The edit mode is versatile and powerful. For instance, it allows you to erase errors without starting over. Second, it allows you to move parts of your design around on the screen, and even duplicate them via a variable sized window. The window is joystick positioned and objects inside can be skewed, rotated, mirrored, and offset. When the image in the window is moved to another portion of the screen, it can allow underlying images to show through transparently wherever black portions appear, or remain completely opaque to the previous screen image. The portion in the window can even underlie the screen image. Objects can also be enlarged or reduced within the window, but this doesn't always work since color may be lost.

The program has a number of screens of template symbols stored on the disk. They are very useful for designing electronics schematics, and later dumping these screens to the printer. The program supports both the Epson MX-80 with Graphtrix and the NEC 8023-A printers. The owners of NEC printers will have to configure their disks with the BASIC program supplied. Those who don't own printers can save their masterpieces to disc for latter view.

While *Graphics Master* has some very good features, it certainly isn't as useful as one would like. First, it is limited to graphics mode eight. Second, while powerful, it isn't as easy to use as any of the demonstrations indicate. The documentation is only fair, and certainly can't cover all of the possibilities or problems that you may encounter while working with the program. There are plenty of ways to make mistakes

GRAPHICS MACHINE

Company: Educational Software Inc.
Language: Runtime BASICA+
Hardware Requirements: 48K

Department: Utilities
Sugg. Retail: \$19.95
Availability: 9
Disk or Tape: Disk

OVERALL RATING **B-**
EASE OF USE **B**
VENDOR SUPPORT **C+**

DOCUMENTATION **C+**
VISUAL APPEAL **C+**
ERROR HANDLING **B+**

RELIABILITY **A**
USEFULNESS **A**
VALUE FOR MONEY **B**

Graphics Machine is a software package that allows you to create various geometric shapes along with text on a Graphics mode 8 screen. Lines, polygons, circles, triangles, and boxes of any size within the limits of screen resolution can be created anywhere on the screen. Moreover, you can put text almost anywhere on the screen, and there is a command to fill in rectangular shapes with any one of three colors. Your screens can be saved as screens or as *Graphics Machine* command files. *Graphic Machine* screen files can then be read by the *Graphic Master* from Datasoft and vice versa. You can load command files which can, in turn, be immediately executed on screen as you watch. A notable feature is the **HELP** command which you may use at any time to get a summary of commands and their syntax. With this package you are also able to turn off the **ANTIC** so that the screens are drawn faster, remove the command window at the bottom of the screen, clear the entire screen, view the disk directory and produce extended error messages.

This software works well, and the manual is clear and well written as far as it goes; but the manual says nothing about how to load the program, and does not mention the BASIC program enabling you to load screens from Atari BASIC as promised in the Educational Software catalog. This you do by removing the BASIC cartridge and booting it from drive one. The disk is not copy protected, and the Atari BASIC program is, in fact, on the disk and is called **BCGET.BAS**. My only real complaint about the package itself is that while you can easily erase shapes, you cannot erase text with equal ease.

FORTH TURTLE GRAPHICS PLUS

Company: Atari Program Exchange
Language: APX Extended fig-FORTH
Hardware Requirements: 24K

Department: Utilities
Sugg. Retail: \$17.95
Availability: 7
Disk or Tape: Disk

OVERALL RATING	C	DOCUMENTATION	D	RELIABILITY	C-
EASE OF USE	C	VISUAL APPEAL	A	USEFULNESS	C+
VENDOR SUPPORT	C	ERROR HANDLING	C	VALUE FOR MONEY	C+

Turtle graphics is usually thought of as either a device for introducing children to computer programming, or a robot control language. *FORTH Turtle Graphics Plus* is neither of these. Rather, it simply adds some graphics extension words to APX Extended fig-FORTH, in a turtle graphics form.

These extension words let you create rectangular windows of any size on-screen with their own coordinate systems independent of the screen proportions or boundaries. Within a window, the invisible turtle can turn any number of degrees, move with or without drawing, or create several pre-defined shapes (square, circle, cube). Lines extending beyond the window boundaries are automatically clipped. CTIA modes 9 and 11 are supported in addition to the usual BASIC modes. Mode 10 is not included.

Since the drawing and window-filling functions use Extended fig-FORTH's Plot and Draw words, the action is a little slow. For example, it takes about ten seconds to fill the screen with a solid color in Graphics 8. Many traditional turtle capabilities such as "senses" are not included. It is possible, however, to create the usual recursive designs, since a recursive capability is part of the package. The sine, cosine, and tangent functions have been implemented in integer data form. The program also includes a Hi-Res screen dump for Epson printers with Graftrax.

The fourteen-page manual briefly explains each turtle word and contains a few examples. On the whole, this is some of the skimpiest documentation I have yet encountered. The entire FORTH source code is printed in the back, but all of the definitions are crammed into nine screens. In addition, some of the demonstrations perform in a strange fashion. For instance, as a spiral grows outward, at some points the completed portion is erased while the outer portion continues to grow. *FORTH Turtle Graphics Plus* is a tool for experienced FORTH programmers; it is not the usual LOGO or PILOT style package.

GRAPH IT

Company: Atari
Language: BASIC
Hardware Requirements: 16K

Department: Utilities
Sugg. Retail: \$19.95
Availability: 7
Disk or Tape: Tape

OVERALL RATING	B	DOCUMENTATION	B	RELIABILITY	B
EASE OF USE	B	VISUAL APPEAL	B+	USEFULNESS	B-
VENDOR SUPPORT	B	ERROR HANDLING	C+	VALUE FOR MONEY	B-

Graph It is a set of plotting programs that comes on both sides of two cassettes. It can plot statistical information such as bar or pie-charts, and mathematical relationships such as two or three-dimensional plots. Each of the programs is completely menu driven.

Bar charts can have ten columns of data. The data can comprise three different factors, so that the combined column length is shown as a three color stack. The computer automatically scales the data to make it fit on the screen. Labels are applied last, giving the chart a finished look.

The relationship of a single item to the total is made clear in pie graphs. This chart works best if there are wide differences between segments. Up to twelve segments can be displayed in three colors. During display, if one or more of the wedges occupies less than 1/14th of the pie, it is grouped together with the label, and so on.

Two dimensional mathematical functions can also be graphed. Three different functions can be overlaid on the screen. The program has automatic scaling, and can plot at four different speeds. Faster speed obviously plots less points. One option allows the joystick to be used to find the slope of a section of the curve between two points.

Finally, it is possible to simulate three-dimensional plots on the two-dimensional screen. The effect resembles a blanket thrown over the object, but without eliminating the underlying lines. While these plots are, at best, experimental, the computer should be allowed to scale them automatically, or portions will fall off screen. Many functions take 5 minutes to plot.

Graph It is useful, but somewhat limited in that there is no supplied utility that will dump screen images to the printer. The program is easy to use, and will present data in a neat organized form.

DRAW IT 1.0

Company: APX/Atari Program Exchange

Language: BASIC

Hardware Requirements: 16K

Department: Utilities

Sugg. Retail: \$39.95

Availability: 8

Disk or Tape: Both

OVERALL RATING **A**
EASE OF USE **A**
VENOOR SUPPORT **C**

DOCUMENTATION **B**
VISUAL APPEAL **A**
ERROR HANDLING **A**

RELIABILITY **A**
USEFULNESS **B+**
VALUE FOR MONEY **A**

The graphics utility *Draw It 1.0* lets you draw pictures, color them, and save them to disk or cassette. It only takes a few minutes of practice. The disk contains *Draw It*, which creates the drawings and saves them, and *Animator*, which lets you format the drawings and create animated screens. The thirty-four page manual contains most of the information on implementing commands, but does not always explain well (such as how to save your new picture and place it in your own program). You can save nine separate pictures with 48K of memory, and five pictures with 32K. You draw the pictures with simple commands, and use four colors (one of them the background) and eight hues to tint the picture. You have sixteen colors to choose from, but only four can be on the screen at once. With a minimum of expertise you can quickly construct such configurations as lines, rectangles (outlined or solid), circles (outlined or solid), text of different sizes, and freehand sketches. A zoom feature with two levels of magnification lets you view the sketch up close for detail work.

The program responds quickly to the joystick-controlled cursor, which you can set for normal or fast speed. I noted no bugs, and enjoyed using the program. I thought the manual well documented with some exceptions. The disk comes with many pictures drawn in detail to help you learn the function keys and experiment with color. The *Animator* demonstrates its capabilities for you. Formatting your own file for animation is another story, however, complicated by unclear descriptions. I recommend this package highly despite the drawbacks in the documentation.

DRAW PIC

Company: Artworx Software

Language: BASIC

Hardware Requirements: 16K; disk drive or cassette player.

Department: Utilities

Sugg. Retail: \$29.95

Availability: 4

Disk or Tape: Both

OVERALL RATING **C+**
EASE OF USE **B+**
VENOOR SUPPORT **B-**

DOCUMENTATION **C**
VISUAL APPEAL **B**
ERROR HANDLING **B+**

RELIABILITY **A-**
USEFULNESS **B-**
VALUE FOR MONEY **C**

Draw Pic is a drawing utility for creating screen images in Graphics modes 3 to 7. They are constructed primarily by using a joystick and a few keyboard commands. These images, which are saved as string data, can be later used as images in your own programs.

There are three drawing modes: plot point, draw line, and the "rubberband" mode. The latter shows the line as you move the cursor, but without actually drawing it. When you press the joystick button, the line is permanent — at least until you erase it. Colors are chosen by picking a color register. The user has the option of modifying each of these four registers with the joystick (three plus a background, except in mode 4). When in the Draw Point mode, depressing the joystick button leaves a trail of dots as you move your cursor. The Draw Line mode draws a line between the first point and the current point. You must be careful, when switching from the Draw Line mode to the Plot Point mode, that you don't move your cursor before making the switch or you will accidentally draw a line to the new position. Pictures can be stored as entire images, or merely portions. The screens are saved as string data, which is much more efficient than as DATA statements. Since a number of screens can be saved, you must be careful when deleting those that you no longer need: if you delete the third image, all those following it will also be deleted. The line numbers that contain these strings can be listed to the disk or to cassette and later entered in or appended to your BASIC program. If you use the hybrid BASIC program listed in the Appendix, then the image can be drawn to the screen at machine language speed.

The program is convenient for producing low to medium resolution screens for use in your programs. While it doesn't have all of the bells and whistles for conveniently forming geometric shapes, it eliminates the drudgery in creating images using BASIC statements from within one's program.

MAPMAKER

Company: APX/Atari Program Exchange

Language: BASIC

Hardware Requirements: 32K

Department: Utilities

Sugg. Retail: \$24.95

Availability: 3

Disk or Tape: Disk

OVERALL RATING	C+	DOCUMENTATION	C+	RELIABILITY	B-
EASE OF USE	C-	VISUAL APPEAL	B	USEFULNESS	C-
VENDOR SUPPORT	C-	ERROR HANDLING	B-	VALUE FOR MONEY	B

Mapmaker is a valuable utility designed to create multi-screen scrolling maps similar to those used in games like *Eastern Front*. It uses custom character sets in Graphics Mode 2 only. This is an enlarged five-color (four colors plus the background) character mode that uses a set of only sixty-four characters. (A screen has twenty characters across and is twelve rows deep.)

Map sizes range from slightly larger than a full screen to a maximum of 128 characters horizontally, or 256 characters deep. Since the maximum screen memory available is only 8K in a 48K machine, the product of the horizontal and vertical dimensions cannot exceed 8,192. This still gives you an area of about thirty-four screens.

The program is primarily keyboard controlled, although cursor movement can also be controlled by joystick. The keyboard arrow keys will move the cursor around the screen window or around the off-screen portion of the map. The X and Y cursor coordinates appear at the lower left, and the screen can be smooth-scrolled by pressing the CTRL-arrow keys. The map is created one character at a time by first pressing the START-key followed by the selected character. While this method lets you use every character, including the Break, Return, Space, and the four arrow keys, it makes the creation of a large map extremely tedious. At the very least, one of the function keys should have been able to place you in the auto mode for a particular direction. I faced this same dilemma when designing an ANTIC 4 (multi-color) map editor over a year ago and managed to include many time-saving functions with the sacrifice of only the ESC-key.

The program does not include a character editor although one was apparently interfaced at an earlier time. The company recommends *Instedit* from APX, and I recommend Datasoft's *Graphic Generator*. You will really need one or the other because the only modified character set is that supplied on the disk. It includes mostly modified characters like rivers, seacoasts, trees, castles, mountains, tanks, infantry, and warships. This is great for designing war game maps, but little else.

Mapmaker is primarily for the programmer who designs games around maps. But designing colorful maps without being able to load your creation with a public domain loader is of little use. Therefore, a clever programmer might strip this program for its loader. A shortcoming is the absence of an option to design maps using ANTIC 4 characters, since about 80% of the games that have scrolling backgrounds use this mode. *Mapmaker* is a good supplementary tool, but while novice programmers may find the program fun to play with, advanced programmers will not find a great deal of practical value here.

ENHANCEMENTS TO GRAPH IT

Company: Atari Program Exchange

Language: Atari BASIC

Hardware Requirements: 24K

Department: Utilities

Sugg. Retail: \$15.95

Availability: 9

Disk or Tape: Disk

OVERALL RATING	C+	DOCUMENTATION	C+	RELIABILITY	C
EASE OF USE	C	VISUAL APPEAL	C	USEFULNESS	B+
VENDOR SUPPORT	C	ERROR HANDLING	C	VALUE FOR MONEY	C

If you have the Atari *Graph It* program and a disk drive, you'll be interested in the *Enhancements to Graph It* package. It contains a diskette with files which you combine with your *Graph It* programs, creating an enhanced *Graph It* program on disk. This eliminates the problem of loading *Graph It* programs from the cassette. You will also be able to load graph programs off disk from one main menu in a fraction of the time it took from cassette. The program also allows you to save and retrieve your graphs to and from disk. You can also delete them. This is especially useful for those 3-D plots that can take hours to create. In addition, trigonometric plots allow you to choose between radians and degrees.

These are useful improvements, but there is still no way to print the screen.

MAPWARE

Company: Atari Program Exchange

Language: BASIC

Hardware Requirements: 40K

Department: Utilities

Sugg. Retail: \$20.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING	C	DOCUMENTATION	B+	RELIABILITY	B
EASE OF USE	D+	VISUAL APPEAL	B	USEFULNESS	D+
VENDOR SUPPORT	C	ERROR HANDLING	D	VALUE FOR MONEY	B-

Have you ever wanted your Atari to draw high resolution maps on the screen, but balked at the monumental task of digitizing the world map? The primary value of *Mapware* is that the digitizing has been done for you, and the resulting files stored on a single diskette. Coordinates for the outline of all of the coastlines, including that of islands and inland seas, have been organized into five files containing a total of 8,917 coordinate pairs. The only political boundary data included are the fifty United States. The claimed resolution of the data is 11 km. (6.8 mi.), but spot checks of several areas failed to confirm this; two to four times 11 km. might be a better estimate. In addition to the data files, the package contains programs capable of generating maps of user-selected areas (or the entire world). Any of four different projection methods may be used with the system to produce maps: cylindrical, azimuthal equidistant, orthographic equatorial, and general perspective.

Time to generate maps ranges from about fifteen minutes for cylindrical to a couple of hours for some of the other projections. Once a map has been calculated and displayed on the screen, the user may save it to disk for later recall (re-display from disk takes two or three minutes). Make sure you have a formatted disk ready; the program does not provide for disk formatting prior to saving a map. Since the entire screen is taken up by the map, no prompts can be given the user, so keep the documentation handy.

The documentation is good. It repeats appropriate information in each program description, so the user does not have to keep flipping pages while working. It's a good thing that the operating instructions are very explicit, because the programs have only minimal error trapping. Parameter entry for map specification is facilitated by many prompts, but the user still needs the documentation in order to make correct responses. Some kind of map or table to provide latitude and longitude for the user to enter as map boundaries would have been a great help.

A serious problem with the graphics display is the lack of overscan correction for individual TV sets. Most sets will produce distorted displays depending on the degree of overscan. Another source of distortion is the method of specifying cylindrical projection map boundaries. For example, specifying a narrow range of longitude and a wider range of latitude for a given map, to be plotted on a standard 320 x 160 screen, results in a map that is stretched out horizontally. The user must calculate the correct screen proportions for given latitude and longitude limits to avoid this distortion. This requirement is not mentioned in the documentation. Still another display problem is differentiating between land and water; filling one or the other would have helped immensely.

A very helpful addition to the *Mapware* system would have been a program to allow the user to create his own coordinate files. The potential usefulness of the maps would be greatly enhanced if the user could input data for rivers and other geographical features, political boundaries, etc. As it stands, only an advanced programmer could devise a method for creating the necessary additional coordinate files.

Mapware output, properly embellished, could serve as the basis for many conceivable applications such as war games and educational programs. A few specialized uses, such as finding the appropriate direction to point a long range radio antenna, are directly supported by the software. For one who needs a data base of coastline coordinates, *Mapware* would be a bargain at twice the price. The average user, though, will probably get little more than "show me what your computer can do" value for the system.

Languages

BASIC Languages

NAME	COMPANY	MEDIUM	USES MEMORY SPACE	PRICE
ATARI	ATARI	CARTRIDGE	8K	\$59.95
BASIC A +	OSS	DISK	14K	\$80.00
MICROSOFT BASIC	ATARI	DISK	19.5K	\$89.95

BASIC XL

Company: OSS

Language: Machine

Hardware Requirements: 16K

Department: Utilities

Sugg. Retail: \$99.95

Availability: 4

Disk or Tape: Cartridge

OVERALL RATING

A

DOCUMENTATION

B+

RELIABILITY

A

EASE OF USE

A-

VISUAL APPEAL

N/A

USEFULNESS

A

VENDOR SUPPORT

A-

ERROR HANDLING

A

VALUE FOR MONEY

A

BASIC XL, a fast and powerful extension of Atari BASIC, offers a number of important features that did not fit in the original 8K ROM cartridge. The language resides in a 16K cartridge, yet occupies only 8K of RAM space in the computer. It does this by internally bank selecting between the 8K ROMs. This makes **BASIC XL** compatible with Atari BASIC because they both use the same token structure. In addition, the program precompiles your program, assigning all line numbers and their references absolute addresses in memory. Execution increases two and a half times, or you can choose to stick with the normal speed.

Noteworthy features include handling DOS commands from BASIC, extended I/O, trace commands with error messages, print using, memory move commands, player-missile graphics, and better string handling (including string arrays). Other features include several structured programming features like IF...ELSE...ENDIF and WHILE/ENDWHILE, automatic line numbering, renumber commands, and deletion of line number ranges.

The program allows easy access to player-missile graphics and lets you move the players around the screen at almost Machine language speed. All operations resemble setting up simple drawing commands. PMGRAPHICS sets up the system, PMWIDTH determines the player's width, PMCOLOR(n) sets the color, and PMCLR clears out the player missile area. PMMOVE positions a player on the screen. You can set the horizontal and vertical positions together or separately. MISSILE creates a missile which you can move with PMMOVE. BUMP reads the collision register. HSTICK and VSTICK return delta-X and delta-Y offsets for the joysticks, simplifying reading the game ports. Another command detects the position of a light pen.

The designers also added input-output commands. You can call most of the DOS commands (like DIR, PROTECT, UNPROTECT, ERASE, and RENAME) directly from **BASIC XL**. You can load and save binary files at Machine language speeds with the commands BPUT and BGET. You can load or save entire screens, and a word processor saves the text file (this normally requires a Machine language program). The program automatically handles numbers in a seven byte internal storage format, thus efficiently performing record processing.

PRINT USING statements make screen formatting much easier. By correctly specifying the format field, you can format numbers containing decimal points (important in lining up columns at the decimal point). The program rounds the numbers off to fit the format field. You can also specify other format characters, such as "\$" for dollars, "," to insert commas into large numbers, or "&" to fill in unused digits with zeros. Other options use the "+" sign for positive quantities, and string formatting with left or right justification specifies "&" and "!" signs. **BASIC XL** also supports TAB and works with a printer.

The addition of string arrays greatly enhances string manipulations, which simplifies character data manipulation. You can separate strings, and FIND searches for a substring within a string. String concatenation has also been simplified. For example, $A\$ = A\$ + B\$$ becomes $A\$ = A\$, B\$,$ and $A\$ (LEN(A\$) +) = C\$$ becomes $A\$ = B\$, C\$,$. Naturally, you can convert strings to numbers and vice versa.

The language includes some nice debugging features. For instance, a trace displays line numbers during the program's execution. LVAR lists to the screen all the variables currently in use (helpful when approaching the 128 variable name limit). Error messages are in simple English, and error handling becomes slightly easier with TRAP, which gives you the error number and line number. I should mention that the program even has sixteen bit PEEK and POKE commands.

Any program written in Atari BASIC runs in *BASIC XL* but not vice versa even though the token structures are compatible. A run-time package available from the manufacturer for use in commercial software carries a one-time use fee of \$300.00. *BASIC XL* is also compatible with Atari DOS, OS/A+ DOS, and OSS's new DOS XL. *BASIC A*= owners will recognize a strong similarity. The major changes are the addition of string arrays, miscellaneous commands, and the ability to precompile for faster execution. Since *BASIC A*= uses a different token structure, it is not compatible with *BASIC XL*. However, a new utility will soon become available for converting those programs to the new language.

The extensive 134-page manual integrates regular BASIC commands with the new commands, a welcome change from the old *BASIC A*= manual that included pages to be inserted in the Atari BASIC user's manual. The documentation for this program includes many examples, several illustrations, and an extensive appendix.

BASIC XL is a fast and powerful extension of Atari BASIC, totally compatible with virtually all software. Its many features make programming easy, especially games that require player-missile graphics. For people writing business software or translating existing programs from other computers, the new string arrays and other string handling features make the task manageable. *BASIC XL* is a truly professional language that should become standard in all future Atari computers.

ATARI MICROSOFT BASIC

Company: Atari

Language: Assembly Language

Hardware Requirements: 40K, disk drive.

Department: Utilities

Sugg. Retail: \$89.95

Availability: 9

Disk or Tape: Disk

OVERALL RATING

A

EASE OF USE

B+

VENDOR SUPPORT

B

DOCUMENTATION

A

VISUAL APPEAL

N/A

ERROR HANDLING

B

RELIABILITY

A

USEFULNESS

A

VALUE FOR MONEY

A

Atari Microsoft Basic is a very powerful version of BASIC, written by the people who developed the language for the Pet, Apple, and Radio Shack microcomputers. Besides making it easier to convert programs from one machine to another, this language has powerful string handling features, greater speed and accuracy when working with mathematical functions, and I/O operations that are somewhat easier to use. It is quite complete, supporting all of the Atari's sound and graphics features, including player-missile graphics. It has auto line numbering, renumber, and delete range of lines commands.

Of course, any language that has advantages also has disadvantages, and *Atari Microsoft Basic* (AMSB) is no exception: it resides on a protected disk, it requires 40 seconds to load, and requires 19.5K of valuable user memory. This means that you have room for about 21K of program, or less if the 850 interface is booted in. The language does not do syntax checking during input. Further, users will be disappointed that those abbreviations of BASIC commands that you have become accustomed to typing (with the exception of ? for PRINT) are not valid in this BASIC. However, users who have used Microsoft's *BASIC* on other micros will find these constraints quite natural.

Perhaps the most significant difference between AMSB and Atari BASIC is in the area of string handling. While Atari BASIC allows DIMensioned one dimensional strings to be as large as the computer's memory, AMSB opts for true string arrays with a maximum string length of 255 characters. This greatly simplifies the task of character data manipulation. In addition to string arrays, there is a true concatenation operator ($C\$ = A\$ + B\$,$). Strings are separated with LEFT\$, MID\$, and RIGHT\$ commands. INSTR performs a search for a string within a larger string. Programmers should be aware that strings are dynamic in memory (they move around), rather than static, as they are in Atari BASIC. They aren't dependable for hiding machine language code or player-missile shape tables.

I/O operations have been greatly overhauled. Many of the XIO functions have been replaced with easy to remember names like LOCK, KILL, UNLOCK, and FILL; however, you still can't read the directory or format a disk. Both these commands have to be done through an included disk file called CIOUSR. Microsoft has sacrificed flexibility for ease of use. For example, you can only OPEN a device for the READ, WRITE, UPDATE, and APPEND functions.

PRINT USING has been fully implemented, permitting you to right justify, insert decimal places, commas, dollar signs, and leading or trailing spaces. This is quite nice when formatting columns of numbers in a business ledger. The INPUT command will allow you to substitute your own Prompt message for the usual question mark. Output is easier with the TAB function, which lets you tab to a given print column, and SPC, that prints a designated number of blank spaces. Screen output now uses PRINT AT (X,Y) as a replacement for the POSITION command in Atari BASIC.

While player-missile graphics is supported moderately with commands like OPTION (PLM) that sets aside space for either single or double resolution PM graphics, and SETCOLOR for defining player colors, most of the other commands still need to be implemented with PEEKs and POKEs. This need to PEEK and POKE is also apparent when the user realizes that there is no AMSB command comparable to STICK(X) for reading the joystick.

None of the above-mentioned lack of easy features is insoluble, because ASMB has the advantage of accepting user-defined functions with the DEF command. Essentially, this means that you can make your own BASIC commands. The inconvenience in regard to the joystick could be solved by the line DEF STICK(X)#PEEK(632 + X). Similar functions could be defined for player-missile graphics. Surprisingly, this feature (which is glossed over in the documentation) is quite powerful.

Some of the other features that are quite useful are the time-dependent commands. The WAIT command allows you to pause the program until a location in memory takes on a specific value. This is useful if you need to wait for VBLANK before changing the display. The AFTER statement allows you to change the flow of a program after a given period of time. TIME\$ returns the time in hours, minutes, and seconds. They have also added a fifth parameter to the sound statement, which designates the duration of the note in 60ths of a second.

AMSB allows somewhat structured programming with IF...THEN...ELSE, and WHILE/ENDWHILE statements. Also, if programs become extremely long and need to be split, variables can be defined with the COMMON statement, and can be passed from one program to the next. I should mention that you can choose the precision of numeric values, making them double precision or define them as integers for added speed. All of the trig functions are available, but only in radians. The most different command is the USR statement. Rather than pass arguments to the machine language routine via the stack, ASMB passes only one integer argument directly to two zero page locations.

Well, there you have it, a powerful language that is somewhat compatible with the BASIC used in other micros. While it does have some disadvantages, such as large memory requirements, lack of syntax checking on input, and limited string length, AMSB offers features that far outweigh its disadvantages. In conclusion, I should mention that AMSB should soon be available on a 16K cartridge.

COMPARISON OF BASIC COMMANDS

Name	ATARI	BASIC XL	Microsoft	Name	ATARI	BASIC XL	Microsoft
System Commands				OPTION FAST		X	
AUTO		X	X	OPTION CHR			X
BYE	X	X		OPTION PLM		PMGRAPHICS	X
CLEAR	CLR	CLR	X	OPTION RESERVE			X
CLEAR STACK			X	PADDLE, PTRIG	X	X	
CLOAD	X	X	X	PEEK	X	X	X
CDNT	X	X	X	PLOT	X	X	
CSAVE	X	X	X	PLOT [X,Y] TO [X,Y]	DRAWTO	DRAWTO	X
DEL		X	X	PMMOVE, PMWIDTH		X	
DIR		X		Poke	X	X	X
DOS	X	X	X	PDP	X	X	
KILL		ERASE	X	PRINT	X	X	X
LIST	X	X	-nn,nn-	PRINT AT	POSITION	POSITION	X
LOAD	X	X	X	PRINT USING			X
LOCK		PROTECT	X	PUT	X	X	X
LDMEM		X		RGET, RPUT		X	
LVAR		X		READ	X	X	X
MERGE	ENTER	ENTER	X	REM	X	X	X
NAME		RENAME	X	RESTORE	X	X	X
NEW	X	X	X	RESUME			X
RENUM		X	X	SOUND	NOT TIMED	NOT TIMED	X
RUN	X	X	X	SPC			X
SAVE	X	X	X	STACK		X	X
SAVE w/LOCK			X	STATUS	X	X	X
TROFF		X	X	STICK, STRIG	X	X	
TRON		X	X	STOP	X	X	X
UNLOCK		UNPROTECT	X	TAB		X	X
VERIFY			X	WAIT			X
BASIC statements				XIO	X	X	
AFTER			X	WHILE, ENDWHILE		X	
BPUT, BGET		X		USR	X	X	
BUMP		X		String Functions			
CLOSE	X	X	X	ASC	X	X	X
CLS			X	CHRS	X	X	X
COLDR	X	X	X	INKEYS			X
COMMON			X	INSTR		X	X
DATA	X	X	X	LEFTS		X	X
DEF			X	LEN	X	X	X
DEFINT			X	MIDS		X	X
DEFDBL			X	RIGHTS		X	X
DEFSNG			X	SCRNS	LDCATE	LDCATE	X
DEFPTR			X	STRS	X	X	X
DPEEK, DPoke		X		STRINGS			X
DIM		X	X	TIMES			X
END	X	X	X	VAL		X	X
EOF			X	VARPTR	ADR	ADR, PMADR	X
ERRDR			X				
FILL	XIO 1B	XIO 1B	X	BASIC Functions			
FOR, TO, STEP, NEXT	X	X	X	ARS	X	X	X
GET	X	X	X	ATN	X	X	X
GOSUB, RETURN	X	X	X	CLOG	X	X	
GOTO	X	X	X	CDS	X	X	X
GRAPHICS	X	X	X	DEG	X	X	
HEX \$		X		ERR[line]		ERR[1]	
HSTICK, VSTICK		X		ERR[type]		ERR[0]	X
IF THEN ELSE	ND ELSE	UNLIMITED ELSE	X	EXP	X	X	X
INPUT	X	X	X	FRE[X]	X	X	X
LET	X	X	X	INT	X	X	X
LINE INPUT			X	LDG	X	X	X
LPRINT	X	X		RAD	X	X	
MISSILE		X		RANDOMIZE		RANDOM	X
MOVE		X	X	RND[X]	0 < X < 1	0 < X < 1	X
NOTE	X	X	X	SGN	X	X	X
ON ERROR	TRAP	TRAP	X	SIN	X	X	X
ON GOSUB	X	X	X	SGR	X	X	X
ON, GOTO	X	X	X	TAN			X
OPEN	X	X	X	TIME			X
OPTION BASE		SET	X	AND, OR, NOT, XOR	ND XOR	X	X

BASIC COMPILERS

	ABC	BASIC COMPILER	BASM
MANUFACTURER	Monarch Data Systems	Datasoft	Computer Alliance
PRICE	\$69.95	\$99.95	\$99.95
FORMAT	1 PROTECTED DISK	1 PROTECTED DISK	1 UNPROTECTED DISK
TYPE	Integer Basic	Integer & Floating Point Basic	Unique Hybrid Basic
COMPILED CODE	P-Code	Machine Language	Machine Language
AMOUNT OF REQUIRED CHANGES TO SOURCE PROGRAM	Few to none if written with integer math variables	Requires some structural changes for program to compile	Complete rewrite required since it is a combination of Basic like and pure Assembly language
EASE OF USE	Easy	Moderate	Moderately difficult
SPEED OF COMPILATION	Fast (1 Pass)	Slow (3 Pass)	Fast (2 Pass)
SPEED OF PROGRAM	4-12 times 7.5 average	Integer mode 5-20 times (avg.) Floating point mode 3 times	Up to 130 times
SIZE OF RUN TIME LIBRARY	4.5K (36 sectors)	3.6K 29 Sectors 4.0K 32 Sectors	0 to 2K
FINAL COMPILED SIZE INCLUDING RUNTIME LIBRARY	.9 to 1.2 times	1.5 times	Not applicable .3 to .5 times source
MAX SIZE OF BASIC PROGRAM	Over 150 Sectors	100 Sectors—one drive +150 Sectors—two drives	Not applicable
MINIMUM SYSTEM REQUIREMENT	40K-1 Disk drive	48K-1 Disk drive	32K—1 Disk Drive
DOCUMENTATION	19 Pages	36 pages— 3 ring binder	91 pages— 3 ring binder
ERROR HANDLING	Will compile with errors but may not run	Will not compile with errors	Will not compile/ Assemble with errors
LICENSE TO USE	Free	Free	Free
GRADE	A	C+	B-

Basic Compilers

Atari BASIC, the most popular language available on the Atari computer, is an interpretative language. As such, it requires a Machine language program to supervise the execution of each BASIC line used. This means that it runs slowly when compared to an equivalent program written in pure Machine language. The interpreter scans your program while it runs in order to find the appropriate subroutines for that chore within its own program code. In addition, it scans your program for the next statement whenever it finds a branch statement in a GOTO or IF statement. The solution is to use a compiler to translate BASIC programs into Machine code. That way the program runs faster because scanning and decoding occur only once—during compilation. Programs written in BASIC that require a real time environment or fast frame rates, such as games, often improve dramatically in speed when compiled.

Three software companies market compiler-like programs. Both Monarch Data Systems and Datasoft offer true compilers, while Computer Alliance offers what would be more aptly called a BASIC assembler. This program, called BASM, is a hybrid language that combines the simplicity of BASIC with the power and data structure of Assembly language. Each of these programs compile BASIC programs into object code that runs much faster than interpreted BASIC. Speed increases vary widely, and often depend on the structure and length of your program. In general, long programs using a large number of variables and doing a great deal of logical branching within the program will execute faster after compiling. In addition, the use of integer variables only, which allows you to use either Monarch's compiler or the Integer option on Datasoft's compiler, will produce code on the order of two to three times faster than a similar program employing floating point variables. Code expansion, a problem on some computers during compiling, offers no problems. You will more likely find disk storage space a limiting factor.

The ABC compiler, a single pass compiler, is the easiest to use. While most of the compilers require extensive changes to your program in order to compile, ABC requires little or no change if the program originally used integer variable constants. Of three attempts to compile two games and one utility program, only one failed on the first attempt. That program generated no errors, but the playfield, which used a modified character set and horizontal display list interrupts to achieve color, did not appear. However, the player missile worked. The working programs were five to six times faster even though the originals used machine language subroutines to drive the player-missile graphics. Evidently extensive logic in the BASIC versions slowed down the frame rate. The utility program compiled to about 20% larger than the original, while the game, which contained a lot of DATA statements and comments, ended up about 25% smaller even with the run-time library attached.

Of course, an Integer compiler doesn't support all BASIC language statements. The lack of floating point math prevents the use of SQR, COS, LOG, RND, and so on. RND, although not supported, can be simulated. Other commands like LPRINT, SAVE, ENTER, CSAVE, CONT, and DOS are also not supported. Unlike the Datasoft compiler, which places DATA statements at the end of the program, DATA statements may turn up anywhere in your program.

Compiling a program is simple. Your BASIC program resides on a regular DOS formatted disk with a BAS extender. The compiler asks for the name of the source file and the name of the object file. It begins compiling and immediately announces the number of variables and the lines in the program. It then compiles line by line at a rate of about 100 lines per minute. If it encounters an error, an error message number is given and the compiler asks you if you wish to continue. Some programs will work even with a minor error. The entire operation takes place in one pass with no disk swaps required. The program compiled into P-code is then loaded with the L-option from the DOS menu. The assembler will allow you to compile at two different run-time addresses and can generate relocatable code.

Datasoft's compiler is a three-pass compiler with two options for Integer and Floating-point BASIC programs. It has a number of command restrictions like CSAVE, DOS, CONT, LIST, LOAD, and so on. All DATA statements must be placed at the end of the program, variables can't be used in GOTO statements, and FOR/NEXT loops can only be terminated with a single NEXT. It also includes a restriction on the way strings are handled. You can't have substrings on the left side of the "=" sign. You can handle this restriction with PEEKs and POKEs if you are a skilled programmer. Because delay loops are lightning fast, you will need to use the system timers to build delays into your programs.

I tried compiling the same programs that I used with the ABC compiler, but was unsuccessful in getting them to run properly despite getting no compile errors. I attribute this to a conflict in memory, but I'm not sure because one of my two-page, six Machine language subroutines worked. Why the sound loop, a single FOR-NEXT loop, hangs baffles me. The inability to compile anything other than the short sample programs was discouraging. The

102-sector program did compile to ninety-nine sectors including the run-time library. Also, the diagnostics are superb. The compiler flags the line number for each error, so that you can continue compiling, noting each error as it occurs. You can also obtain a line map on the screen or printer, which helps you locate a run-time error since the location of the Machine language code for each line number is cross referenced.

BASM is a two-pass BASIC assembler that takes a unique hybrid language, a combination of BASIC and Assembly line statements, and compiles the BASIC portions while assembling the Assembly statements into pure Machine code. This method produces extremely fast code with speeds up to 130 times that of the original. The advantage arises because the language is closer in format to BASIC and easier to learn than pure Assembly language. In theory, you could learn to understand Assembly language by watching this compiler/assembler produce readable Machine language. The language differs widely from either BASIC or Assembly, and like all new languages, takes time to learn. It uses many structured statements like WHILE, ENDWHILE, and ENDIF. Additional operators like OR, AND, XOR, and NOT have been added. Graphics commands are supported but require opening a channel before using and closing. You can freely mix BASIC with standard Assembly language in any statement, useful for indirect addressing in a BASIC statement.

Despite a lengthy manual that describes all the commands available, beginners will have great difficulty in learning and using the language. You enter all lines in the editor mode. The text editor resembles those in other assembler packages, but it doesn't check syntax. You learn the extent of your errors only at compile time. In fact, you get few error messages. When I tried compiling two of the examples in the manual, the first only six lines long, the program informed me that there were four errors. The longer program generated twenty-four. The manual advised that exact spacing of terms is critical, so I checked that also, but I could not find my errors. I'm not implying that the program doesn't work, only that you may have trouble using it.

The consensus is that compilers generate faster code than can be obtained with BASIC interpreters. Each of the compilers has its advantages and disadvantages. The *ABC Compiler* is the easiest to use, and useful if your program uses Integer variables only. It generates fast P-code impossible to read, which although not as fast as Datasoft's, takes less space. It is also the least expensive. Datasoft's compiler is a pain to use, especially if you don't have two disk drives. However, it works faster and can compile programs with floating point operations. It also has the advantage of Assembly language code that you can tinker with. Its main disadvantages are that BASIC programs sometimes need significant changes to compile, and that large programs can't be compiled because of a combination of code expansion and limited disk storage. Finally, I think BASM worth looking into, but find it hard to compare it to the others because it needs specially written programs to work. It is fast, but difficult to learn.

Assemblers

ASSEMBLER EDITOR - ATARI - \$59.95

Atari's *Assembler Editor* cartridge is the assembler that most Atari owners whet their teeth on. It is a good beginner's assembler that doesn't need a disk drive, and it is relatively inexpensive. For ease of use, it was designed to be a co-resident assembler editor. This means that both the editor and assembler are in memory at the same time. While this has the disadvantage of limiting room for large source files, it eliminates the need to save the source file off to disk before swapping in the assembler which is assumed to be on another disk. This arrangement is ideal for those writing short programs that need to be assembled and debugged almost in tandem with the editor.

This cartridge has a line editor somewhat akin to BASIC. Each line is assigned a line number. Individual lines can be edited using the Atari's full screen editing feature. The editor has search and replace capabilities as well as the ability to renumber. Source code can be saved to tape or disk.

The assembler is not a very fast or powerful one. It lacks a large number of features, like the ability to chain source files, symbol table listing, and local labels. And it is interminably slow. Long assembly listings take ten or more minutes with the listing on. Let's face it, it was designed for people who want to write small assembly language routines that interface with BASIC. The assembler can save object code to disk, tape, or memory. One very nice time saving feature is that object files having multiple origins load into either cassette or disk in the proper memory locations. This eliminates the need to load and save your files in pieces.

It is very convenient to have a built-in debugger in the cartridge. It has most of the usual features: display and change either memory or registers, and step and trace. But the disassembler unfortunately doesn't support a printer, and the trace will lock up on encountering the CPY command.

The documentation is alright. While not tutorial in form, beginners will find it readable. Remember, the cartridge is an Atari product, and thus is fully supported. While this assembler may give a mediocre performance, it does have strong points in that it is a complete assembler that can be used by both Atari cassette and disk users. Since it is in cartridge form, it is very convenient to use.

MACRO-ASSEMBLER - ATARI - \$89.95

The Atari *Macro Assembler* is a serious package for professional programmers. It is a tremendous improvement over the *Assembler Editor* cartridge in terms of features, but is very cumbersome to use since it is entirely disk based. The editor and the assembler are two separate files on the disk, and must be loaded one at a time. This means that after editing, source code must be saved to disk before loading in the assembler, which then must re-read the source file before assembly. While this is O.K. for assembling a large project with multiple source files, it is inconvenient for small projects. And since this package does not offer a monitor and debugger, it is useless without either the *Assembler Editor* cartridge or Dunjon's *Debugging Tool* form APX.

The editor is essentially the same text editor available from APX. It is a full screen editor and quite capable of writing moderate sized text files. There are no line numbers in the source code. The editor is adequate. It has search and replace commands, and can copy and move lines. Users familiar with word processing will like this type of editor.

The assembler is extremely fast and has a complete set of pseudo-ops. It supports conditional assembly, local labels, and has a complete macro facility. The macro commands allow the user to write new assembler instructions. When the assembler encounters the corresponding name in the instruction column, the saved lines will be substituted for the Macro name and assembled. In most cases the Macro has parameters passed to it. Size of macros is limited to 255.

The many paged documentation isn't for beginners. The structural format of everything is carefully explained, but there are too few examples and little detail. The disk itself is unfortunately protected. There is no way to back the disk up, and if it crashes, the user will need to wait several days at best for a replacement. The protection also precludes any use with the Ramdisk. In sum, while this is a powerful assembler, its disadvantages may far outweigh its speed and power.

MAC 65 - OPTIMIZED SYSTEMS SOFTWARE - \$80.00

Mac 65 is a very complete and powerful macro assembler that in many ways is the logical upgrade of the old *EASMD*, also from OSS, and Atari's *Editor-Assembler* cartridge. Both the editor and assembler are co-resident in memory. The debugger is a separate program, since it has more features and requires more memory than just a simple monitor. The debugger, however, can be resident along with the editor and assembler if it is loaded at LOMEM, and debug is used to alter the pointers to a much higher LOMEM. The entire package is meant to operate under OS/A + DOS, and is also supplied on the disk. It is a much more structured and easier to use DOS.

The editor is line oriented. Beginners will like its syntax checking mode that can catch most common entry errors. This feature can be disabled if you want to use the editor to enter straight text. The editor has the usual global find and replace, renumber, delete range of lines, copy or move lines, and auto numbering. String replacement can be localized to a range of lines. The editor even has a convenient hex/dec converter.

The assembler resides above HIMEM as most assemblers should. This gives the user an uninterrupted block of RAM for text, object code, and symbol table. You have to intentionally specify through a pseudo-op to write to memory. The assembler defaults to saving object code to disk. This is the safest method because putting the code in the wrong place can clobber the source file, *MAC 65* of DOS. This is probably just as well, because you can't debug without loading the debugger. The assembler has local labels, conditional assembly, and macros. There is a very nice macro library included on the disk. Macros can be any length, true also with labels. Since labels can be 127 characters long, and all characters are significant, they can be used as meaningful variable descriptions. Error messages are in English. The assembler also has a full range of pseudo-ops, and best of all, it is fast.

The debugger is the best included with any of the assemblers on the Atari. It is fully relocatable and can be placed anywhere in memory. It is protected, so that the user cannot monitor a command that would intentionally destroy itself. It has all the standard monitor features, and in addition, has break points included with its step and trace function. Individual disk sectors can be read and written. Moreover, the debugger has a mini-assembler for making quick on-line fixes without having to type in the hex equivalent.

The documentation is fair, but could stand more examples, and beginners will find it difficult. I suggest that beginners read a good tutorial on the subject. The package is suited to advanced users who need a fast assembler and one with considerable power. I think this one will fit the bill, and users will find it more convenient to use than the Atari *Macro Assembler*.

MAE — EASTERN SOFTWARE HOUSE - \$169.95

Eastern House's *Macro Assembler-Editor (MAE)* is a very powerful co-resident macro assembler, but has a non-standard file structure and a set of pseudo-op codes that make it incompatible with other assemblers. Yet its power and versatility are apparent in its macro capabilities, and its ability to generate relocatable object files.

The text editor is a full-screen editor. It is powerful, and has the ability to do conditional search and replace, as well as copy and move lines. Since the lines are numbered there is a renumber command. Normal, input of source code uses an auto line numbering scheme. Source code is entered in free form, with only a space between fields required.

The assembler exhibits several good features. It is very fast, and allows an option to continue assembling after encountering errors. It resides in memory at \$3000, splitting user RAM. The assembler should have been placed above HIMEM. Disk I/O is much slower than normal DOS loads because of its non-standard format. It further allows conditional assembly for both source and macros. The macros features are extensive. Local labels are also supported and, of course, the symbol table is sorted. The assembler is the only one that can generate relocatable object files. This is a powerful aspect, but is over-emphasized in the documentation at the expense of a good explanation of other features.

There is a standard debugger, or monitor. Surprisingly, for a package with this power, it does not have step and trace, nor the ability to set break points. These are important functions and neglected in this package.

The documentation is fair. Numerous items are either out of order, or just not explained. It certainly wasn't written for beginners. The assembler has considerable power that isn't properly explained, and requires user experimentation. In sum, MAE is a powerful and advanced assembler for the expert. Its non-standard pseudo-ops make this a difficult assembler for users who have built a library of routines on other assemblers and would like to upgrade to a more powerful one. Beginners will find this assembler too intimidating.

SYNASSEMBLER - SYNAPSE - \$49.95 (Disk)/\$89.95 (Cartridge)

Synassembler is a fine co-resident assembler much suited to beginners. Its design philosophy is to make assembly language programming as similar to BASIC as possible. Its editor is line oriented and fully supports the Atari screen editor. It does not use an auto-line editing mode, but instead uses the TAB key to enter the next line number. While this may seem awkward at first, it is useful for correcting a mistake in a previous line and then moving back to the line you were currently on without having to break out of, and re-enter an auto-number mode. The editor is complete and supports search and replace, copy and move lines, and renumbering.

The assembler itself is modest, but adequate for most uses. It supports conditional assembly, and uses local labels that save a lot of space in the symbol table. The symbol table (which can be listed) is sorted. Files can be chained and assembled to disk if memory is insufficient. Multiple ORG's aren't supported, but there is no problem in just advancing the program counter. Files are saved in contiguous blocks, and may require more disk space. Perhaps the best part about this assembler is that it is very fast. The assembler sits in high memory, as it should, and leaves a very big chunk of memory for source, object code, and symbol table. Source code starts at HIMEM and builds down; the symbol table starts at \$1D00 and builds upward. Object code can reside safely anywhere in between.

There is a very complete monitor that can step and trace through a program. It has a string search mode and a very helpful hex/dec converter. It can read and write binary files directly to disk from the monitor and, in addition, can read and write individual sectors from a disk. This is a very nice feature since it can be used in conjunction with the disassembler for examining errant files.

This assembler is a translation of the *S.C. Assembler II Version 4.0* that is on the Apple computer. Surprisingly, it is the only translation that I've ever seen that is fully integrated to the Atari system. For example, *Synassembler* uses standard filespec parameters when addressing any device such as the disk drive or the printer.

Synassembler is a very pleasurable assembler. Small source files can be edited, assembled, and debugged entirely within memory very quickly. It is very easy to use. The documentation, which can be read by beginners, is clearly written, but a bit sparse. There are instructions for converting assembler cartridge files to this program, so that those readers who are thinking about abandoning the cartridge for a faster assembler can do so.

EDIT 6502 - LJK - \$199.95

Edit 6502 is a co-resident editor assembler on cartridge. This in many ways makes the package very convenient to use, and would have been very useful to Atari 400 owners if it would have only supported cassette. The package is an Apple translation that has been partially integrated with the Atari system. The assembler supports standard filespec parameters when addressing any device, such as printer and disk drive; the editor does not.

The editor is line oriented. Its major fault is that it disables the Atari built-in screen editor, and uses the same form of text entry as the Apple. When a line has to be re-entered, it has to be completely copied over using the forward Arrow key. The Insert and Delete keys work at this point, but do not function except when in the line editor, or during actual program entry modes. The Tab key is supported. The pause during long listings still uses the Control-S key, as on the Apple. The editor does have most of the expected functions, like global search and replace, copy and move lines, plus renumbering.

The assembler is adequate and fast. While it supports conditional assembly and lists a symbol table, it lacks local labels which normally save considerable space in the symbol table. One has a choice of saving object code to memory or disk. This is convenient when debugging small programs in memory.

The monitor is also co-resident. It is a good monitor with step and trace, the ability to examine and change memory and registers, disassemble or move memory, and search for strings. It can also read or write sectors to and from disks. In addition, there is an interactive disassembler supplied on a separate disk.

The 38 page documentation is poor and sparse, and isn't meant for beginners. This is unfortunate since this is a beginner's assembler. The author wastes a lot of space discussing his programming philosophy, and a good third is taken up with instructions about using the disassembler. All in all, while this is a beginner's assembler, convenient to use and in cartridge form, it is still horribly overpriced and poorly documented.

ATARI ASSEMBLER COMPARISON

I — GENERAL INFORMATION

NAME	COMPANY	PRICE	MIN. HARDWARE
ASSEMBLER EDITOR	ATARI	\$ 59.95	16K
MACRO ASSEMBLER	ATARI	\$ 89.95	32K, DISK
MAC/65	OPTIMIZED SYSTEMS SOFTWARE	\$ 80.00	32K, DISK
SYNASSEMBLER	SYNAPSE	\$ 49.95	48K, DISK
MAE	EASTERN SOFTWARE HOUSE	\$169.95	32K, DISK
DATASM 65 2.0	DATASOFT	\$ 89.95	48K, DISK
EDIT 6502	LJK	\$199.95	32K

II — RATINGS

	ASSEM. EDITOR CART.	ATARI MACRO ASSEM.	MAC/65 OSS	SYN ASM	EASTRN (MAE)	EDIT 6502 CART.
OVERALL RATING	B -	B	A -	A -	B	C
FUNCTIONALITY & FEATURES	C +	B +	A	B	A -	C +
EASE OF USE	B	C +	B	A -	B -	B
DOCUMENTATION	B +	C -	C -	B -	B -	D
VALUE FOR MONEY	B	B	B	A	C	D

III — DOCUMENTATION

COMPLETE INSTRUCTIONS	YES	YES	YES	YES	YES	YES
WRITTEN FOR NOVICE	YES	NO	NO	YES	NO	NO
SUFFICIENT EXAMPLES	YES/NO	NO	NO	YES/NO	NO	NO
REFERENCE CARD/SHEETS	YES	YES	NO	NO	NO	YES

IV — FILE HANDLING

SPEED OF FILE ACCESS	O.K.	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
FILE TYPE (B,T)	B,T	B,T	B,T	B,T	B,T	B
PIECE FILE TOGETHER FROM SEGMENTS	YES	YES	YES	YES	YES	YES
CASSETTE SUPPORT	YES	YES	NO	YES	YES	NO
APPEND LOAD	YES	YES	YES	YES	YES	YES
UNMODIFIED DOS	YES	YES	YES	YES	YES	YES

V — MISCELLANEOUS

	ASSEM. EDITOR CART.	ATARI MACRO ASSEM.	MAC/65 OSS	SYN ASM	EASTRN (MAE)	EDIT 6502 CART.
RUN COMMAND	NO	NO	NO	YES	NO	NO
BRK TO MONITOR OR MONITOR COMMANDS	QUIT	NO	QUIT	YES	YES	YES
RESET RECOVERY PROCEDURE	YES	YES	NO	NO	YES	YES
USEFUL SUBROUTINES PROVIDED	NO	NO	YES	YES	NO	NO

VI — EDITOR

	LINE	SCREEN	LINE	LINE	SCREEN	LINE
FULL SCREEN OR LINE ORIENTED	GOOD	GOOD	GOOD	GOOD	GOOD	O.K.
RESPONSIVENESS	YES	YES	NO	YES	YES	YES
TAB SUPPORT	YES	YES	NO	YES	YES	YES
AUTONUMBERING OR LINE COLLECTING INPUT MODE	AUTO	AUTO	AUTO	YES	YES	AUTO
REQUIRES 4 DIGIT ZERO FILLED LINE NUMBERS	NO	NO	NO	YES	NO	NO
STOP/ABORT LISTINGS	BOTH	BOTH	BOTH	BOTH	YES	BOTH
REPLACE A LINE	YES	YES	YES	YES	YES	YES
SCAN FOR STRING	YES	YES	YES	YES	YES	YES
LOCAL/GLOBAL CHANGE	YES	YES	YES	YES	YES	YES
COPY/MOVE LINES	NO	YES	NO	YES	NO	YES
SHOW MEMORY LEFT	NO	YES	YES	NO	NO	YES
PRINTER SUPPORT	YES	YES	YES	YES	YES	YES
RENUMBER	YES	N/A	YES	YES	YES	N/A
SYNTAX CHECK INPUT	NO	NO	YES	NO	NO	NO

VII — ASSEMBLER

	ASSEM. EDITOR CART.	ATARI MACRO ASSEM.	MAC/65 OSS	SYN ASM	EASTRN (MAE)	EDIT 6502 CART.
SPEED OF ASSEMBLY	SLOW!	FAST	FAST	FAST	FAST	O.K.
FREE FORMAT OR COLUMN DEPENDENT	COL	COL	COL	FREE	FREE	FREE
STANDARD SYNTAX	YES	YES	YES	YES	YES	YES
FLEXIBLE SYNTAX	NO	NO	NO	NO	NO	SOME
LONGEST LABEL ALLOWED	106	127	127	32	31	10
EXTENDED BRANCH MNEMONICS (BGE, BLT)	NO	NO	NO	YES	NO	NO
PAUSE/ABORT ON ERROR	NO	ABORT	YES	ABORT	YES	YES
ENGLISH OR NUMERIC ERROR MESSAGES	NUM	ENG	ENG	ENG	NUM	ENG
SYMBOL TABLE PRINTED	NO	YES	YES	YES	YES	YES
SYMBOL TABLE SORTED	NO	YES	YES	YES	YES	YES
OBJECT ADDRESS/LENGTH PRINTED	NO	YES	YES	NO	NO	YES
IMMEDIATE OPERAND TYPES (HEX, DEC, CHR, BIN, MSB, LSB, OCT)	HOCML	HOCB MLO	HOCBML	HOCBML	HOCB MLO	HOCBML
ADDITION/SUBTRACTION IN EXPRESSIONS	YES	YES	YES	YES	YES	YES
MULTIPLICATION/DIVIS. IN EXPRESSIONS	NO	YES	YES	YES	YES	YES
DEFAULT BASE	HEX	HEX	HEX	HEX	HEX	OEC
TERM TYPES (HEX, DEC, CHR, BIN, MSB, LSB, OCT)	HOCML	HOCB MLO	HOCB ML	HOCBML	HOCB MLO	HOCB
LOCATION COUNTER TERM [*]	YES	YES	YES	YES	YES	YES
NUMBER OF PSEUDO OPS	11	25	17	12	26	20
ASSEMBLY ORIGIN OP [ORG] or [* =]	YES	YES	YES	YES	YES	YES
OBJECT ORIGIN OP [OBJ]	YES	YES	NO	YES	YES	YES
EQUATE OP [EQU]	YES	YES	YES	YES	NO	YES
ZERO PAGE ADDRESSING HANDLED AUTOMATICALLY	YES	YES	YES	YES	YES	YES
CHAR STRING OPS	YES	YES	YES	YES	YES	SOME
RESERVE MEMORY OP	YES	N/A	YES	YES	YES	YES
TWO BYTE CONSTANT OP	YES	YES	YES	NO	YES	YES
ONE BYTE CONSTANT OP (MSB OR LSB)	YES	YES	YES	LSB	YES	LSB
LISTING CONTROL (EJECT, SKIP)	YES	YES	YES	YES	YES	YES

	ASSEM. EDITOR CART.	ATARI MACRO ASSEM.	MAC/65 OSS	SYN ASM	EASTRN (MAE)	EDIT 6502 CART.
TURN LISTING ON/OFF	YES	YES	YES	YES	YES	YES
END OF ASSEMBLY OP [REQUIRED?]	NO	OPT	OPT	OPT	YES	OPT
LINK ASSEMBLY FILES	NO	YES	YES	YES	YES	YES
SAVE OBJECT CODE AUTOMATICALLY	YES	YES	YES	YES	NO	YES
MACROS WITH SYMBOLIC REPLACEMENT	NO	YES	YES	NO	YES	NO
UNIQUE LABELS WITHIN MACROS	N/A	YES	YES	N/A	YES	N/A
CONDITIONAL ASSEMBLY [IF, SET, ETC.]	YES	YES	YES	NO	YES	YES
RELOCATABLE OBJECT CODE [EXTERNAL/INTERNAL LABELS]	NO	NO	NO	NO	YES	NO
LOCAL LABELS/VARIABLES	NO	YES	YES	YES	NO	NO
OBJECT CODE TO DISK, TAPE, MEMORY	D,M,T	D,T	O,M	D,M	O,M,T	D,M

VIII — MONITOR

DISPLAY MEMORY	YES	N/A	YES	YES	YES	YES
CHANGE MEMORY	YES	N/A	YES	YES	YES	YES
DIS — ASSEMBLER MEMORY	YES	N/A	YES	YES	YES	YES
MOVING MEMORY	YES	N/A	YES	YES	YES	YES
EXECUTE PROGRAM	YES	N/A	YES	YES	YES	YES
EXAMINE & MODIFY REGISTERS	YES	N/A	YES	YES	YES	YES
STEP & TRACE	YES	N/A	YES	YES	NO	YES
CONVERT HEX/DEC & DEC/HEX	NO	N/A	YES	YES	YES	YES
STRING SEARCH	NO	N/A	YES	NO	YES	YES
DISK [READ & WRITE SECTORS]	NO	N/A	YES	YES	NO	YES
BINARY LOAD & SAVE	YES	N/A	YES	NO	YES	NO

An Overview of FORTH

by D.W. Neuendorf

An informed reading of the reviews of FORTH products requires at least a rudimentary understanding of the language. This overview is intended to assist the uninitiated in handling the terminology of the following reviews.

Charles H. Moore, the inventor of FORTH, wanted to give his new language a name describing it as he saw it: a "fourth generation" computer language. The IBM 1130 computer, on which the language was developed in 1970, permitted only five-character names, so FOURTH was shortened to FORTH. It is debatable whether Moore's creation truly represented an advance in computer programming. But no one will dispute the idea that FORTH is an unusual language.

FORTH is known as a Threaded Interpretive Language (TIL). It is "threaded" in the sense that each command, or "word," is defined by following a thread of many generations of previously defined words all the way down to FORTH's "kernel" of primitive words. Since FORTH is "interpretive," it allows the use of an interactive direct mode like that of BASIC. Unlike BASIC, however, the compilation of words is a convenient and routine part of any interactive session. The resulting high execution speed and easy interaction makes FORTH simultaneously useful for Real-Time applications and conducive to fast and error-free programming. Originally written to control scientific equipment, FORTH remains one of the best languages for that application. On the Atari and other microcomputers, FORTH has become popular with many game programmers and others who need fast control of graphics and sound. The FORTH standard most commonly used on microcomputers (including the Atari) is that of the FORTH Intersect Group, known as fig-FORTH.

FORTH is a stack-oriented language. Practically every number handled in a FORTH program is stored on the stack at one time or another. FORTH uses Reverse Polish Notation (RPN), the most natural way to handle a stack. In RPN, an operator is simply moved from its usual position between the numbers being manipulated (infix) to the position immediately following (post-fix). For example, A+B becomes AB+. This takes a bit of getting used to, but pays off with the highly efficient coding of expressions. Integer arithmetic is also natural in a stack-oriented language, so FORTH does not normally support floating point numbers.

Programming in FORTH is a process of defining progressively higher level words, starting with the standard words in the FORTH kernel. Once past the lower level words, with their esoteric names (e.g., "." for "pull a number off the stack and print it to the screen"), the programmer is free to use very meaningful word names (up to 31 characters in many versions of FORTH). Programs are usually designed from the top down (continually subdividing general tasks into more and more specific subtasks), and coded from the bottom up.

Structured programming is very strongly encouraged by FORTH. There are no line numbers or labels, and nothing like a GOTO statement. Instead, FORTH provides an impressive array of decision and loop constructs that aid structured programming. A related quality is modularity. A word designed for a given purpose can become a part of the language, for use in any program. Thus, it is natural to treat FORTH words as modules.

While strongly disk oriented, FORTH's disk interaction is relatively primitive. Source code (i.e., word definitions) is stored on disk in groupings called "screens," designed so that one software screen will fit on one physical display screen. There is no directory of screens and their contents, so the programmer must track that himself.

Many of these features are controversial. The combination of RPN with cryptic primitive words makes it easy for an unfriendly programmer to write unreadable programs. Integer arithmetic is inadequate for certain types of applications. FORTH's non-standard disk I/O makes it incompatible with such disk operating systems as Atari's DOS 2.0S. Even Charles Moore admits that FORTH is relatively difficult to learn. Most of these problems, however, can be attacked by taking advantage of FORTH's greatest strength: extensibility. The Editor, Assembler, disk I/O, or any other feature of the language can be modified as readily as any other program routines. At least one version designed for the Atari system has DOS 2.0S disk I/O available. An ambitious programmer could probably even modify his FORTH to use infix notation instead of RPN (although this is not recommended). Once the difficult task of learning the standard FORTH has been accomplished, FORTH can be almost anything the programmer wants.

A desirable version of FORTH for the Atari will obviously offer good documentation, error handling, and other features common to professional quality software. Good vendor support for a FORTH implementation can mean a continuing stream of new extension words, continually updated documentation, or (possibly) the provision for licenses needed for marketing programs written in FORTH. Since words can be defined in terms of other FORTH words or in machine language, those versions which utilize more of machine language will run faster. Some versions of FORTH are better integrated with Atari's Operating System than others. This quality is very good for those

writing software for the Atari only, but a handicap for those who want to produce "portable" software that can be used with little or no change on other systems.

Assuming there is a choice among generally good quality packages, the consumer should compare price and check for FORTH extension words applicable to his particular needs. Just remember that the lack of a certain FORTH word need not be as fatal as it would be in BASIC (try living without PEEK and POKE!). If the vendor of a FORTH package can define the word, so can you.

QS FORTH

Company: Quality Software

Language: Machine and FORTH

Hardware Requirements: 24K

Department: Utilities

Sugg. Retail: \$79.95

Availability: 5

Disk or Tape: Disk

OVERALL RATING **B**
EASE OF USE **A**
VENDOR SUPPORT **B**

DOCUMENTATION **A**
VISUAL APPEAL **N/A**
ERROR HANDLING **C**

RELIABILITY **C**
USEFULNESS **A**
VALUE FOR MONEY **C**

Quality Software has done justice to the name of their company with the production of *QS FORTH* for Atari computer systems. To the fig-FORTH kernel they have added a more friendly Editor than that standard to FORTH, many extension words to take advantage of the Atari's hardware and Operating System, and a variety of user friendly features. Perhaps best of all is the comprehensive, literate, and physically attractive documentation.

Graphics and sound control words are similar to the analogous BASIC commands, making the adjustment easy for a BASIC programmer. *QS FORTH* has no FIL or FILTER words to correspond to those of APX's *Extended fig-FORTH*. On the other hand, there are words for switching between normal and inverse video. Operating System I/O words are also similar to the BASIC versions. There is no word equivalent to *Extended fig-FORTH*'s BOOT850, to boot the RS232 interface. More importantly, there is no provision for creating a boot tape version of a FORTH program. The Operating System's floating point routines are not supported, leaving *QS FORTH* with no floating point package at all.

The Editor supplied with *QS FORTH* is simpler to use than the standard fig-FORTH Editor. One particularly nice feature is the use of the "+" and "-" keys (arrow keys without using the CTRL key) to page backward and forward through the screens. This Editor relies heavily on the Atari's screen editing features, unlike the fig-FORTH version. Experienced FORTH programmers may not like using a non-standard Editor, but beginners will appreciate not having to memorize a lot of special commands.

Control structures added to the standard fig-FORTH structures are BEGIN...AGAIN (an unconditional loop which must be broken by ABORT or a similar word), and CASE. The latter is a powerful structure which does for structured programming languages what ON...GOTO does for BASIC. Unfortunately, the Assembler has only the usual control structures BEGIN...UNTIL, BEGIN...WHILE...REPEAT, and IF...THEN...ENDIF.

The most outstanding feature of *QS FORTH* by far is its 160-page manual. Professionally printed on three-hole punched paper in a convenient 6" x 9" size, the documentation is physically easy to handle and read. Its pages are loose enough that their holes will not easily be torn out, unlike those of most Atari program documents. The writing style is friendly and informative. There is a beginner's introduction to FORTH, followed by exhaustive explanations of the various *QS FORTH* features. An advantage to this manual over a general FORTH text is that it's written with the Atari system in mind. It does not entirely replace a book like *Starting FORTH*, but it will be a very valuable supplement for both the beginner and the expert. In addition to the detailed explanations, useful features include a map of Atari RAM with *QS FORTH* loaded in, and a complete glossary of *QS FORTH* words (something, surprisingly, that is not included in all versions of FORTH). Programming examples abound. A response card is included to register the owner to receive free updates of the manual.

QS FORTH does not contain some of the useful features found, for example, in APX's *Extended fig-FORTH*; and its price is a bit on the high side. It is, on the other hand, a quality product through and through. The documentation and convenient Editor will probably make it less intimidating to a newcomer to FORTH than some other versions of the language.

EXTENDED fig-FORTH

Company: Atari Program Exchange

Language: Machine and FORTH

Hardware Requirements: 16K (disk preferred)

Department: Utilities

Sugg. Retail: \$39.95

Availability: 8

Disk or Tape: Both

OVERALL RATING
EASE OF USE
VENDOR SUPPORT

C+
C
C

DOCUMENTATION
VISUAL APPEAL
ERROR HANDLING

C-
N/A
C

RELIABILITY
USEFULNESS
VALUE FOR MONEY

C
B
B

Extended fig-FORTH is a budget-priced version of fig-FORTH for Atari computer systems. It includes the standard 6502 fig-FORTH kernel, Editor, and Assembler, as well as popular double precision extension words. Many words allow the use of the Atari Operating System Routines (I/O, graphics, and floating point), and the sound hardware capabilities are also included. Some FORTH, Inc. words and the FORTH, Inc. Editor are present, to make the language more compatible with Leo Brodie's *Starting FORTH*. All of this is designed to run on a 16K system, whether disk or tape drive based. A 51-page manual comes with the language.

The Atari-specific extension words are quite similar to their BASIC counterparts. An Atari BASIC programmer will have little difficulty adjusting; for example, "GR.7:COLOR A:PLOT 5,10" to "7 GR. 2 5 10 PLOT." The FIL word is simpler to use than BASIC's X10 "fill" option. Operating System I/O commands are almost as straightforward. The SAVE and CSAVE words create self-booting disk and tape copies of the RAM-resident FORTH program in the manner analogous to the BASIC commands. BOOT850 boots up the RS232 interface, a function which has no BASIC counterpart. The floating point package contains floating point stack manipulation words analogous to those for single and double precision numbers, as well as a few functions for floating point calculations. There are no trigonometric functions; in fact, the only functions beyond the four standard arithmetic operators are natural and common logarithms, and their corresponding exponentials.

The Assembler supplied with any version of fig-FORTH allows FORTH words to be defined directly in machine language, enabling them to run at maximum speed. *Extended fig-FORTH* includes an Assembler very similar to the well-known version written by Ragsdale. Loop constructs available in this Assembler include BEGIN...END and IF...THEN. This is a rather limited selection, but is enough to allow structured Assembly Language programming—a necessary capability when labels are not allowed. Like all other parts of a FORTH package, the Assembler uses Reverse Polish Notation.

A DEBUG package contains several diagnostic words, mostly used for examining RAM or the FORTH stack in various ways. One unusual word that promises to be very useful is DECOMP. It "decompiles" any word that has been created using a colon definition (the most common way of defining a FORTH word). This is very useful if the source code is unavailable for the word, or if viewing it would require disrupting the debugging process to load in another screen.

Copying a whole diskette using the DISKCOPY word, 90 sectors at a time, is a very slow process, requiring many disk transfers. This is one case where compatibility with DOS 2.0S would have made life much easier.

fig-FORTH's standard Editor is included "as is," though the user also has access to the Atari's resident Editor. The fig-FORTH version provides many powerful features for moving, deleting, copying, and otherwise manipulating code, but requires that the user memorize a plethora of single character commands.

The documentation for *Extended fig-FORTH* is a study in contrasts. The initial warning that it assumes familiarity with FORTH is not to be taken lightly: a beginner in FORTH can be very intimidated. Explanations of the various words are often extremely terse or entirely lacking, leaving the user to experiment for himself. There isn't even the slightest pretense of offering a small tutorial section in the manual. Trying to check the claim that the full set of fig-FORTH words had been implemented proved to be impossible, because there is no complete listing of all the words in the package.

On the other hand, the author actually included a complete set of source screens for all of the words except the machine language kernel. This proved invaluable during this review, because I wiped out part of the Editor and had to replace it. (Beware: the disk is not write-protected in any way.) Several screens were included to improve compatibility with *Starting FORTH*. These screens do indeed make it relatively easy to follow the book while sitting at the computer.

An expert FORTH programmer could sit down with *Extended fig-FORTH* and be immediately productive. The program's price is also very attractive. A beginner could probably survive if he kept to the course charted in *Starting FORTH* until he felt sure of himself. The more timid beginner should look for a version of FORTH with much better documentation.

FDOS

Company: SUPERware

Language: Extended fig-FORTH

Hardware Requirements: 16K

Department: Utilities

Sugg. Retail: \$39.95

Availability: 3

Disk or Tape: Disk

OVERALL RATING	C	DOCUMENTATION	D	RELIABILITY	C
EASE OF USE	C	VISUAL APPEAL	N/A	USEFULNESS	C
VENDOR SUPPORT	D	ERROR HANDLING	C	VALUE FOR MONEY	C

A major shortcoming of FORTH is its incompatibility with disk operating systems. *FDOS* provides extension words to APX's Extended fig-FORTH to make this version of FORTH compatible with DOS. A package of this type is long overdue; unfortunately, *FDOS* has some serious flaws of its own.

On either a one drive or two drive system, *FDOS* words will convert DOS files to FORTH screen-compatible *FDOS* files. Data can be read from either DOS or *FDOS* files to any desired RAM area, or written from RAM to *FDOS* files. FORTH screens and *FDOS* files can be copied and moved around, and *FDOS* files can be subjected to DOS-like manipulations. The latter functions include Delete, Rename, Lock, and Unlock. No *FDOS* to DOS conversion, or other actions which would result in creation of a DOS file, are supported. Both DOS and *FDOS* directories can be displayed. *FDOS* files can only be stored on *FDOS* initialized disks, each of which takes several minutes to prepare. A bootable FORTH and FORTH source screens can co-exist on an *FDOS* disk with *FDOS* files.

Graphics files, such as those created using Datasoft's *Graphic Master*, convert easily using *FDOS*. Simply load the file in DOS or *FDOS* form to RAM starting at the beginning of screen memory. Text files are another matter. Every type of character data file that I tried—tokenized and untokenized BASIC source, word processor files, database files—came out garbled when loaded to screen RAM. Character data on the screen could successfully be saved to an *FDOS* file and redisplayed by loading to screen RAM. There may be a method to accomplish the same thing with character data in DOS files, but the documentation gives no help in discovering it.

Three pages of documentation consist mostly of a glossary of *FDOS* words. The explanation is clearly written, but does not cover the full use of *FDOS*. One example of an *FDOS* file would have been a life-saver. As for vendor support, the documentation does not even contain an address for SUPERware, let alone a telephone number. It would not take much for SUPERware to upgrade *FDOS* to a super product, but as it stands, it does not measure up.

Miscellaneous Utilities

S.A.M. [Software Automatic Mouth]

Company: Don't Ask Software

Language: Assembly Language & BASIC

Hardware Requirements: 32K

Department: Utilities

Sugg. Retail: \$59.95

Availability: 8

Disk or Tape: Disk*

OVERALL RATING **A -**
EASE OF USE **B -**
VENDOR SUPPORT **B +**

DOCUMENTATION **A -**
VISUAL APPEAL **N/A**
ERROR HANDLING **B**

RELIABILITY **A**
USEFULNESS **B**
VALUE FOR MONEY **A -**

S.A.M., *The Software Automatic Mouth*, is a speech synthesizer. Unlike most speech synthesizers, which are expensive and rely on electronics, S.A.M. is entirely software drive. Speech no longer has to sound as if it were produced by a dim-witted robot speaking in monotone. Instead, stress can be applied to specific syllables to produce a more human sound.

Of course, there is a penalty to pay for this speech quality, and that is the loss of 8K of user memory and blanking of the screen during vocal output. This latter effect is necessary because gabs are inserted into the speech waveform each time the 6502 waits for ANTIC to access memory. Speech becomes distorted if the screen isn't blanked. The loss of available user memory is not a big problem since S.A.M. is not a very large machine language program. However, larger programs that utilize both speech and graphics might not fit. This is especially true if the user opts for a straight English text-to-speech input rather than the usual phoneme-to-speech input. The English text to speech version requires an additional 6K of computer memory.

The phoneme system for speech input is the most versatile, and sounds the best. It allows stress markers to be placed on any syllable for inflection. In addition, the pitch of S.A.M.'s voice can be altered and S.A.M. can speak slow or fast. The program also understands punctuation. For example, a period inserts a pause and causes the pitch to fall, while a question mark causes the pitch to rise after a brief pause.

The phonetic alphabet consists of 48 phonemes divided into vowels and consonants. Each produces a true speech sound. When these are combined, any word can be pronounced correctly and with the proper inflection. For example, the sentence "Why should I walk to the store?" would be written as "WAY2 SHUHTD AY WAO5K TUX DHAH STO5H5R." Each of the numbers represents the stress on a syllable. The number 2 indicates a very emphatic stress, while 7 drops the pitch. Six is neutral. While composing sentences looks difficult, it is easy to learn the phoneme system with practice. A dictionary of 1,500 common words is included with their phonetic spelling.

The English text-to-speech program call "Reciter" is extremely easy to use, although its speech isn't as understandable. All that one has to do is define a string called SAM\$, fill the string with English words, and make a CALL to the program. Each string can be up to 255 characters long. There must be a break somewhere in the string, because S.A.M. can only speak for 2.5 seconds without exhibiting a slight pause in his speech. The authors claim that it can speak 90% of the words input correctly. Actually, the program, which uses 400 rules for combining letters, can speak with very few errors. Words like "computer," "today," and "machine," which gave the Votrax *Type'n Talk* so much trouble, are no problem to S.A.M. However, words like "mouse," "nuclear," and "scream" are troublesome. Perhaps they do not follow S.A.M.'s sound rules.

The program can be used very effectively to interface with educational and adventure games. Perhaps it could be used during an arcade game to warn of imminent danger. It might even prove useful if interfaced to a telephone answering machine.

All in all, S.A.M. is the best sounding and least expensive speech synthesizer on the market. But while it produces understandable, inflected speech, it still sounds like computer-generated language. Its sampling rate of 7000 Hz. only produces sound with a high frequency of 3500 Hz. The drawback of having the screen blank during vocal output may be troublesome, but it can be overridden if the user is willing to accept coarser, degraded speech. Still, it is a breakthrough, and a fine piece of software that is extremely easy to use.

TALK TO ME

Company: Dynacomp

Language: BASIC

Hardware Requirements: 850 Interface & Votrax

Department: Utilities

Sugg. Retail: \$14.95 cassette / \$18.95 disk

Availability: 2

Disk or Tape: Both

OVERALL RATING **D**
EASE OF USE **B**
VENDOR SUPPORT **C**

DOCUMENTATION **C-**
VISUAL APPEAL **C**
ERROR HANDLING **C+**

RELIABILITY **C+**
USEFULNESS **D+**
VALUE FOR MONEY **D-**

Talk to Me is a demonstration and tutorial of the capabilities of the Votrax *Type'n Talk* voice synthesizer. In addition to including a mode in which the user can type words and sentences into the computer and have the speech synthesizer pronounce them, it demonstrates the unit's inability to pronounce certain words as well as methods used to correct the sound. For example, "today" must be spelled incorrectly as "tuday" in order to be pronounced properly.

The disk automatically boots in the RS-232 interface, on the Atari 850 expansion interface module. The instructions, however, require you to set switch #5 on the Votrax at 1200 baud. When you do this, the unit is barely understandable, speaking only parts of words. Upon reading the BASIC program, it turns out that it requires 2400 bauds and switch #6 to be set.

Overall, this program is short and of little value. The people at Votrax provide adequate instructions, and a sample program that will put your computer into the *Type'n Talk* mode with no trouble.

MUSIC PLAYER

Company: APX/Atari Program Exchange

Language: Assembly

Hardware Requirements: 16K

Department: Utilities

Sugg. Retail: \$24.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING **C**
EASE OF USE **C**
VENDOR SUPPORT **C**

DOCUMENTATION **C**
VISUAL APPEAL **C**
ERROR HANDLING **C**

RELIABILITY **C**
USEFULNESS **B**
VALUE FOR MONEY **C**

Users of Atari's *Music Composer* cartridge soon become frustrated at the lack of "portability" of the music it creates. *Music Player* provides one solution to this frustration by permitting the use of *Music Composer*-generated files with BASIC or other languages. All that's required is that the language permit AUTORUN.SYS files, and have the equivalent of BASIC's OPEN and CLOSE commands. The latter would be true of any language that uses the Operating System I/O routines.

The *Music Player* disk comes with the machine language routine in an AUTORUN.SYS file; a sample BASIC program to demonstrate the use of the routine; and eleven very tastefully chosen sample music files. To add music to a program, copy the AUTORUN.SYS file and your own *Music Composer*-generated file onto the disk where the program will be stored. Some code will have to be added to the CALLing program to set up the reading of the music file and the PUTing of commands to the player routine. From there, the music can be started, paused, resumed, re-started, or ended under the program and/or user control. Since the sound registers are manipulated during Vertical Blank Interrupts, music will play if desired during any type of activity except I/O. All of the above, including the nice BASIC demo, works very smoothly.

Cassette users are out of luck, because *Music Player* as it stands runs only on a disk-based system. This is a shortcoming that could have been much more easily rectified by the author than by most users, since it would involve modification of a machine language routine. Certain sample music files failed to load properly the first time tested, but the problem disappeared. If the default size of the music file buffer is insufficient, it can be changed by the user in direct mode. A method for incorporating the change under program control, however, is neither obvious nor adequately explained in the program's documentation. Another omission is a discussion of how to modify the AUTORUN.SYS file to create a self-booting BASIC program that uses this utility. *Music Composer* files can only be played exactly as they would be as if using the cartridge. It would have been nice to add an ADSR envelope option. Finally, the documentation does not cover the important question of legal implications of using the routine in commercial programs.

Within the limitations noted, *Music Player* is a worthwhile utility. In particular, it converts the *Music Composer* cartridge from a mere novelty to a useful programming tool.

HEXABUG

Company: APX

Language: Machine

Hardware Requirements: 48K

Department: Utilities

Sugg. Retail: \$39.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING	B+	DOCUMENTATION	B+	RELIABILITY	B
EASE OF USE	B	VISUAL APPEAL	A	USEFULNESS	B+
VENDOR SUPPORT	C	ERROR HANDLING	B+	VALUE FOR MONEY	B

Hexabug is a debugger primarily designed for the Atari Macro Assembler. Written as an Autorun.Sys file, it loads and initializes itself when you boot the program. In the process it resets the low and high memory pointers, reserving a permanent place in memory for itself throughout your debugging session.

You can call DOS with the Start key from *Hexabug*, load the routine you want to debug, and go back to DOS when finished to fetch another routine without losing your debugger. If your program is already set up with Autorun from DOS Option L., Binary Load, you will first have to place a breakpoint before the segment you want to work on. *Hexabug* will take over at the breakpoint. If the program is not set up with Autorun, you can reset the program counter to the appropriate segment of code.

This debugger offers a number of nice features, and is visually attractive as well. The screen divides into eight horizontal strips with a message and command line at the bottom. The top of the screen displays the 6502's registers with the status register broken into individual flag bits, each labeled. This far surpasses the common practice of representing the status register as a single byte in hex. Below this appear strips showing breakpoints, the stack page, the area in memory currently addressed by the program counter, and three independently addressable areas of memory. The standard Atari Control-arrow keys move you from field to field and to left or right within a field. In addition, you can scroll the strips devoted to stack, code, and memory in ascending or descending order, making each strip a scrolling window. Simply positioning the cursor and typing the new hex values modifies the program counter, breakpoints, and memory. You can display and modify memory in either ASCII or hex, useful when working with text and character tables.

Hexabug also supports the following functions: moving through the program line by line; continuing with or without preset breakpoints; bypassing good sections; and two DOS commands, one preserving *Hexabug* and the other aborting it. You can also search for a string of bytes, and scroll large areas in memory quickly to bypass tables and other data you don't want to wade through. You can toggle between your program's screen display and *Hexabug*'s with the Select key and turn off *Hexabug*'s smooth scrolling feature if your own program requires the use of HSCROL. *Hexabug* will also disassemble the code strip.

All of these are powerful features, and many programmers will choose *Hexabug* as the debugger of choice. This power does require certain trade-offs, however. For one thing, *Hexabug* is not relocatable. Because it occupies memory from \$9000 to \$C000, if you have a program designed for a 48K machine you will have to relocate those segments of code while debugging. *Hexabug* also uses page zero from \$80-\$9A. Moreover, you cannot define a symbol table, so you cannot use labels. Most of the time you will not find these restrictions prohibitive, but they can cause occasional difficulties.

Hexabug does require familiarity with the op codes and system equates in their "pure" hexadecimal form rather than just the mnemonics and standard labels. You must modify programs in hex, although you can edit text and characters directly. Because it contains no mini-assembler, you cannot code LDA#\$FF; for example, you must modify directly (A9 FF). The op codes differ for each addressing mode and there is no consistent pattern to them across modes, making modification a difficult task, particularly for a beginning machine language programmer or one accustomed to mnemonics and labels. You can mitigate this difficulty if you have a printer to keep your assembly listing nearby, and have a good table of op codes. If you are just beginning to explore Machine language, *Hexabug* may not help you. You might find it somewhat intimidating as your main debugger, even though convenient for modifying text, data, and characters.

On the other hand, people comfortable with 6502 op codes (especially those who have worked in Machine language for years and on the earlier, more primitive systems) may well find *Hexabug* to be a real joy. Its power enables you to modify code and memory for RAM quickly and easily, if you know what you want to do. For such a programmer, *Hexabug* can become almost transparent in its ease of use as you scan up and down memory, changing what you will.

MACHINE LANGUAGE MONITOR

Company: Eastern Houses Software

Language: Machine Language

Hardware Requirements: 8K cassette; 16K disk

Department: Utilities

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Both

OVERALL RATING	B	DOCUMENTATION	B	RELIABILITY	B
EASE OF USE	A -	VISUAL APPEAL	C	USEFULNESS	B +
VENDOR SUPPORT	B -	ERROR HANDLING	B	VALUE FOR MONEY	B -

This utility is of benefit to the Machine Language/Assembler programmer as well as to advanced FORTH and BASIC programmers.

It provides 23 commands, including:

- (1) examine or alter memory
- (2) examine or alter microprocessor registers
- (3) branch to a program
- (4) save or restore memory
- (5) move contents of memory
- (6) initialize memory segments to any value
- (7) compare memory contents
- (8) search for ASCII or HEX strings in memory
- (9) disassemble or modify code

The instruction manual is compact, but thorough and well laid out. Even beginners could follow the load procedures and use of this product.

One feature which calls for special attention is its autoloading program, which boots itself up when the power is turned on. If the BASIC cartridge is installed, this program remains in memory (below the point at which BASIC is loaded). Also, memory and register features allow extended debugging.

This is a powerful utility. I would caution you to take care in modifying registers, etc. This is not for the beginner, although it will be useful at intermediate levels and invaluable at advanced user levels.

Finally, loading DUP.SYS (DOS command in BASIC) will overwrite this software unless you use the MEM.SAV feature of DOS.

In summary, this is one of those programs which you come to appreciate quickly, and wonder how you got along without it before.

BANNER GENERATOR

Company: APX/Atari Program Exchange

Language: BASIC

Hardware Requirements: 16K

Department: Utilities

Sugg. Retail: \$17.95

Availability: 8

Disk or Tape: Both

OVERALL RATING	B	DOCUMENTATION	B	RELIABILITY	C
EASE OF USE	B	VISUAL APPEAL	C	USEFULNESS	B
VENDOR SUPPORT	C	ERROR HANDLING	C +	VALUE FOR MONEY	B +

Children, college students, and computer retailers are among those who will enjoy using *Banner Generator*. An 80-column printer produces banners with letters up to six inches high, any message or design you can type on your Atari keyboard. Uses include personalized greetings (especially engaging to the young), advertising messages, room decorations, and so on. Even practical jokers will doubtless find hundreds of applications.

Banners produced by the program are readable and of good quality for most purposes. Since the characters are simply magnified versions of the computer's character set (including custom character sets), they look rather crude at close range. The spacing between words seems excessive, but an intermediate programmer can easily change this. An Atari 825 printer can output two character print intensities (but with only one level of intensity within a single banner). This feature is easy to implement on most other printers if you know how to adjust your printer control codes. Character height and width are also adjustable between six to ten inches.

Banner Generator is easy to use for routine banner messages. Just answer a few quick prompts and wait for your printer to gobble up a few feet of paper. The delay of about five seconds between characters is negligible compared to the printer time; and as banner generating programs go, this one works quickly. Speed will, of course, vary with your choice of character dimensions.

There are a few minor faults with the program. First, it does not give you the option of exiting, so it is necessary to hit System Reset to return to BASIC. Character height and width are measured in terms of 1-10 arbitrary units. It would have been better to be able to specify these dimensions in inches. The program itself should compensate for half character widths when the dark print option is chosen; but instead, the inputs must be adjusted. Also, if you try to use the unprintable characters as fill characters, the program will send these to the printer, producing erratic results. Although the documentation points out this limitation, the program ought to detect and forestall the error. Finally, because large sections have consecutive line numbers, the BASIC code can be a pain to modify.

The documentation is typical APX quality. There are detailed instructions on every phase of the program's operation, a sample run, and even includes a sample banner-sized character. The authors give some hints on the use of alternate character sets, but no detailed instructions.

Banner Generator certainly does what it says it will do, and does it with a minimum of fuss. It is not a highly polished program, but is worth the money to anyone who needs computer-generated banners.

SCREEN PRINTER INTERFACE

Company: Macrotronics, Inc.

Language: Machine

Hardware Requirements: printer

Department: Utilities

Sugg. Retail: \$79.95

Availability: 3

Disk or Tape: Disk

OVERALL RATING **A -**
EASE OF USE **A -**
VENDOR SUPPORT **B -**

DOCUMENTATION **B +**
VISUAL APPEAL **N/A**
ERROR HANDLING **B**

RELIABILITY **B +**
USEFULNESS **B**
VALUE FOR MONEY **A -**

Screen Printer Interface — Version 2.0 allows Atari 400 and 800 owners to print both text and graphics screens to any of four graphics printers without an 850 interface module. This is good news especially to 400 owners, who up until now have been unable to interface well with a printer. This is also good news to 800 owners, since the price of this software-hardware combination is little more than a third of the retail price of the interface module alone.

The printer (Epson, IDS, Centronics or Trendcom) is connected by a hardware cable interface through joystick ports 3 & 4 of the computer. You must specify which computer-printer combination you own when ordering. The spacing between the ports is different on both computers, as is the connector on each printer.

The screen printer software comes on an unprotected disk that is completely compatible with DOS 2.0. Once loaded through the boot process, it is tucked safely away in memory and safe from BASIC, the Assembler Cartridge, and PILOT. It occupies less than 3K of memory. It is completely transparent to the user, and can be activated when needed by the Control P key. In addition, any commands that send information to device P: will cause this information to be printed. BASIC commands such as LPRINT behave just as they would if a printer were connected through the serial port.

The best part about the program is that it can print virtually any graphics screen while the host program is running. The utility automatically reads the display list to determine which information to print. The user can adjust the scaling, select positive or negative images, and determine the grey scale from either hue or luminance. Printing player-missile graphics and screens which have been fine scrolled are a little more difficult, but possible. In the case of player-missile data, 14 memory locations that contain player-missile parameters must be updated before printing. These are thoroughly documented. The only thing that I found the program unable to print properly is GTIA graphics modes. I tried printing BRASS from the GTIA demo disk and got a very poor representation. I noticed later that there is an error code for attempting to print this type of screen. I did not get an error during the attempt.

Since the printed image can be scaled independently on both axes, it is possible to both vary the aspect ratio to fit the printer and paper, and, if the user likes, create wide images that are printed in strips that can be glued together.

I found the software amazingly versatile. The user can control almost any parameter, although the graphics print mode is a little slow, possibly to prevent the print head from overheating when printing areas with lots of black. I was pleased that I didn't need to change any of the switches inside my Epson printer as I usually need to do when switching from printing on my Apple to printing on the Atari through the 850 interface. And I was pleasantly surprised that DOS was available immediately from BASIC without loading in.

The documentation is very good. There is a lot of information and examples in the 50 page manual. It explains how to interface with all language environments, and techniques for working with all types of graphics. The only thing that is not explained is whether or not the software could be booted in from OSS DOS that many use when working with BASIC A+. In conclusion, Macrotronics's *Screen Printer Interface* is a superior product that will save users attempting to produce graphics screen dumps to a printer both time and money.

SCREEN MAKER

Company: ICON Software

Language: BASIC

Hardware Requirements: 48K

Department: Utilities

Sugg. Retail: \$34.95

Availability: 3

Disk or Tape: Disk

OVERALL RATING **B**
EASE OF USE **B**
VENDOR SUPPORT **C**

DOCUMENTATION **B**
VISUAL APPEAL **C**
ERROR HANDLING **C**

RELIABILITY **B**
USEFULNESS **B**
VALUE FOR MONEY **A**

One of the major advantages of Atari computers is the versatility of their display hardware. One of their main disadvantages is that the operating system and most languages support only a fraction of this versatility. *Screen Maker* consists of an editor for setting up screen mode layouts; facilities for saving, loading, and printing the layouts; and a utility for creating subroutines to display the custom screens in a BASIC program.

The editor is fairly easy to use. One simply types in a mode number, then moves a cursor down the screen to the point at which the next graphics mode is to begin. This process is repeated until the desired arrangement of mode windows has been created. The editor automatically moves the cursor in increments of full mode lines, so there can be no problem of miscalculated numbers of scan lines in a given mode window. Up to fifteen windows can be created on any one screen, using any combination of modes 0 through 8. Unfortunately, the various Antic modes and three GTIA modes not supported by BASIC are also not supported by *Screen Maker*.

Testing a screen design is a simple process. A cursor controls the window to be tested. Printing is done directly from the keyboard, while drawing in graphics mode windows is done with a joystick. The cursor is too far to the left to be seen on screens with normal overscan. This can be a problem because the cursor is the only indication that the blank screen is ready to be tested. There are also some error trapping problems in the testing routines that can cause a system crash.

When the programmer has designed all the necessary screens for a program, *Screen Maker* automatically creates a subroutine to use the screens. Writing to a screen is very convenient. Simply set certain variables to values corresponding to the screen and window numbers, then call the subroutine. Printing or drawing is done in the normal manner. Screen RAM seems to be allocated for maximum convenience and minimum economy. These subroutines take up a lot of space (12K is not at all unusual if a Graphics 8 window is included).

The 17-page manual was obviously designed in the APX format, but it has been reduced to about half size (including the print). Everything you need to know is clearly explained. There is a detailed tutorial that is beautifully REMarked. If your BASIC program has RAM to spare and does not require modes other than 0 through 8, *Screen Maker* is worth its weight in gold; it will save you hours of setup and debugging of custom display lists. When RAM gets tight, though, you're better off programming your own screens.

ATARIWRITER PRINTER DRIVERS

Company: APX / Atari Program Exchange

Language: Machine

Hardware Requirements: 32K, *Atariwriter*

Department: Utilities

Sugg. Retail: \$24.95

Availability: 3

Disk or Tape: Disk*

OVERALL RATING **A**
EASE OF USE **A**
VENDOR SUPPORT **C**

DOCUMENTATION **C**
VISUAL APPEAL **N/A**
ERROR HANDLING **N/A**

RELIABILITY **A**
USEFULNESS **A**
VALUE FOR MONEY **B+**

Atariwriter Printer Drivers enable the *Atariwriter* word processor to work with printers other than the Atari 820, 822, 825, and 1025 printers supported by the cartridge. With this program, the word processor also supports the Atari 1020 and 1027, Epson FX-80, MX-80, MX-100, MX-80FT III, MX-100FT III, MX-80 and MX-100 GRAFTRAX models, GEMINI-10, NEC-8023A, and PROWRITER-8510. Depending upon the printer, these printer drivers allow underlining, sub- and superscripts, condensed or proportional fonts, elongated characters, and double-column printing. Without the drivers, you would need to embed printer control codes within your text.

You can transfer these drivers to your word processing disk and rename them *Autorun.sys*, which ensures that they get placed into memory automatically when you boot the disk. The drivers are completely transparent, and you need only use *Atariwriter* commands to employ any of their special features.

MEGAFONT

Company: Xlent Software

Language: BASIC

Hardware Requirements: 48K

Department: Utilities

Sugg. Retail: \$19.95

Availability: 2

Disk or Tape: Disk

OVERALL RATING **A**
EASE OF USE **A**
VENDOR SUPPORT **B-**

DOCUMENTATION **A**
VISUAL APPEAL **A**
ERROR HANDLING **A**

RELIABILITY **A**
USEFULNESS **B**
VALUE FOR MONEY **A**

MegaFont is a utility program which promises a lot and gives you even more. This utility allows you to convert a character set created with a set editor to a format that can be used with your printer. Several converted fonts are included on the disk, and they are fantastic. They include a standard, two cursive, three fancy, italic, Greek, and a computer-type font.

You can print text files with the special fonts and print program listings with the inverse and graphics characters and the redefined character sets. Finally, the program allows the dump of Graphics 7+ and 8 screens in quarter, half, or full page sizes to the printer in inverse or normal mode.

Obviously, *MegaFont* does what it sets out to do and is simple to use. It is a bit slow in the graphics dump mode, but the maximum time is eight minutes for a full page.

I found that if you try to load a file that does not exist, you get a "File Not Found" on the screen which then locks up the computer and requires re-booting. The documentation is simple and short. There was, however, an oversight in the seven-page instruction booklet. Two paragraphs indicated you could print out in boldface or regular print, but there were no prompts within the program that allowed for this. The printers that can be used are the Prowriter, NEC, or Epson with Grafrax.

Overall, this program rates the highest praise for its simplicity associated with the complex task at hand. It is, indeed, a most useful program, and well worth the cost.

THE PILL

Company: Computer Software Services

Language: Machine

Hardware Requirements: 48K

Department: Utilities

Sugg. Retail: \$69.95

Availability: 5

Disk or Tape: Both

OVERALL RATING **A-**
EASE OF USE **A-**
VENDOR SUPPORT **B**

DOCUMENTATION **B**
VISUAL APPEAL **N/A**
ERROR HANDLING **C**

RELIABILITY **A**
USEFULNESS **B**
VALUE FOR MONEY **A**

The Pill transfers cartridge programs onto a disk or cassette as a back-up. The manufacturer insists that the program works and lists a phone number for answering problems. Of course, the first thought that comes to mind with a program like this is the possibility of piracy. However, the designers included several features that make mass copying impractical. The package includes a small cartridge with a unique on/off switch, a double-sided disk, and a tiny piece of tubing. To use the program, you insert the tubing into the interlocking switch (the small hole on the right inside the open cartridge door on your computer). Do this cautiously, or you may find it impossible to close the door once you remove the tubing.

Transferring a cartridge program onto a disk involves several steps. First you boot side one of the program disk. Then you insert the cartridge to be transferred into the computer. Next you turn the disk to side two and press Return to save the program onto the disk. Once the program has been transferred, you turn off the computer and remove the original cartridge. You insert *The Pill* with the switch in the Off position, turn on the computer, boot side two of the disk, and type in the number of the program you want. Once the program has been loaded, you switch on *The Pill* cartridge, press the Return key, and the original cartridge program appears on the screen. This is not an easy or inexpensive process for potential pirates.

Although the documentation is generally clear, you must read it carefully. One small mistake means starting over. Numbering the steps and including illustrations (particularly for inserting the tubing into the interlocking switch) would have clarified things. You also need to exercise care not to lose the tubing, which is miniscule. The disk also includes two utilities—a memory test and a disk rpm speed test. Despite its minor weaknesses, I highly recommend this excellent piece of software.

UTILITY DISKETTE II

Company: APX / Atari Program Exchange

Language: Basic and Machine

Hardware Requirements: 24K

Department: Utilities

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Disk

OVERALL RATING	B	DOCUMENTATION	C	RELIABILITY	B
EASE OF USE	B	VISUAL APPEAL	N/A	USEFULNESS	A
VENDOR SUPPORT	C	ERROR HANDLING	B	VALUE FOR MONEY	A

Utility Diskette II is a package of five disk-oriented utilities primarily for the intermediate to advanced programmer. All five will prove very useful, while one or two may become indispensable. These programs will pay for themselves many times over in convenience and time saved.

Menu has the most applicability of all the programs in the package. It is meant to be copied to diskettes in a user's library to facilitate selecting and running BASIC programs from the diskettes. The program occupies only 15 sectors; in most cases, the resulting convenience will be worth this small overhead cost. *Menu* displays the names of up to 46 files found on the disk, with each file identified by a number. Simply entering the number of the desired file (and hitting RETURN) runs the specified program. Entering an invalid response has no effect at all. One thing that should be (but isn't) noted on the screen is that entering an "O" runs the *Menu* program again, displaying a new menu if another diskette has first been inserted.

Lister lists to the printer programs which contain "unprintable" characters: inverse video, cursor controls, etc. If you like to put REM's in inverse video, your programs are littered with unprintable characters. *Lister* will print an optional key table explaining what its substitute characters stand for, then list the desired program with the unprintable characters replaced by the substitutes. For example, the ESCAPE-SHIFT-CLEAR character is replaced in the listing with [CLR]. A nice feature is that Assembler source code may be listed as well as BASIC.

One problem with *Lister's* handling of inverse video is that the closing bracket is evidently printed when the first non-inverse character is encountered. If the last character in the statement is in inverse video, as would be the case with a REMark, the closing bracket isn't printed until the first character of the following statement. The program is also slow and could have been significantly enhanced by a machine language subroutine(s).

Compare analyzes two BASIC programs, and prints (to screen or printer) the lines in which the two programs differ. After listing the appropriate lines, the program presents a table summarizing the analysis: how many lines differed between the two programs, and how many were unique to each program. *Compare* performs its job reasonably fast and produces readily understandable output. It should be useful when you have several versions of a program in various stages of modification. Both *Lister* and *Compare* use variables for printer control codes. This localizes any changes needed for using printers other than the Atari 825.

Negatives in *Compare* include the need for both programs to be in LIST (untokenized) format. Many of us keep our programs in SAVE (tokenized) format in order to allow use of the RUN"D: . ." command. Perhaps a more serious problem is that both programs must be on the same diskette. In order to get the full benefit from this utility, you would have to conform some programming habits to those of the authors of *Compare*.

Hexdump should be useful particularly to machine language subroutine programmers, or to those who use data files frequently. It produces a table containing the hexadecimal contents of every byte in a given file, either on disk or in RAM, and the corresponding ASCII characters. The tabular output is easy to interpret. Unfortunately, *Hexdump* does not have *Lister's* capability for printing "unprintable" characters (even to the screen). Only ASCII characters are printed, leaving a blank where any special ATASCII character should be.

Sort is a standalone sorting utility containing a machine language subroutine. Often a sorting routine is part of some other program, and cannot be used conveniently to sort a file not created by that program. *Sort* allows for sorting of any file (fixed or variable length) containing two 250 bytes per record, in ascending or descending order. It can handle files as large as 470 diskette sectors. Just be careful to keep a backup copy of the file to be sorted because the original file will be replaced on the diskette by the sorted file (unless you have more than one disk drive).

Documentation for all of these utilities is adequate and well written, though terse. Sample listings in the review copy were poorly reproduced and had handwritten titles.

All things considered, *Utility Diskette II* is an excellent value. There have been times when I might have paid the price for the *Compare* program alone.

MANTIS BOOT TAPE DEVELOPMENT SYSTEM

Company: APX/Atari Program Exchange

Language: Assembly

Hardware Requirements: 40K

Department: Utilities

Sugg. Retail: \$24.95

Availability: 6

Disk or Tape: Both

OVERALL RATING **C**
EASE OF USE **C**
VENDOR SUPPORT **C**

DOCUMENTATION **D**
VISUAL APPEAL **C**
ERROR HANDLING **C**

RELIABILITY **D**
USEFULNESS **C**
VALUE FOR MONEY **B**

Professional software developers often aim their efforts at a particular segment of the personal computer market. Owners of 16K cassette-based machines comprise an important part of the Atari user's market. *Mantis* is intended as an aid to those who are developing self-booting, machine language programs for this market segment. It is named after the praying mantis, a large "bug-eating" insect, for obvious reasons. *Mantis* allows a programmer to read a boot-format machine language tape file into RAM, debug it, store it on disk, test it in a 16K tape environment, and return the corrected version to tape.

There are some very professional features offered in *Mantis*. The main display consists of three windows on one 128-byte section of RAM: a hexadecimal value table, a binary bit map, and an ATASCII character table. The windows can be moved over the entire RAM of the computer in several very useful ways: in 128-byte chunks, eight bytes at a time via scrolling, a direct jump into a specific area of RAM, or a jump to some address found in the data being displayed (e.g., a pointer). A value at any address can easily be changed by the user. The bit-mapped and ATASCII displays make it easy to find character and player-missile data in RAM, and to see the results of changing the data. Once debugged, the subject program can be test run just as if the computer being used were a 16K cassette-equipped machine. Finally, the finished boot-format program can be put conveniently on cassette.

This system is certainly not for everybody. First of all, the Assembly Language programmer who wants to debug his code in straight machine language (no mnemonics) is a rare bird indeed. This and the lack of a trace capability mean that *Mantis* could not be more than a supplement to the DEBUG mode of the Assembler/Editor cartridge (or another debug utility). A file must be in boot-tape format before it can even be loaded from disk, let alone tape. The program does not have the capability of converting Assembler object code to boot-tape format, though the documentation does include a sample of code to accomplish this. The documentation is harder to read than most APX materials, with any given piece of information being difficult to locate.

More seriously, *Mantis* does not always respond as its documentation claims. Trying to load a boot tape which will not run in 16K is supposed to give the error message "Data block out of range." My attempt to load a 24K boot tape got the message "Not a load file." It is also possible to lock up the computer while loading a boot tape into *Mantis*. This happened once when I tried to load a boot tape that puts code into *Mantis*'s own RAM. *Mantis* is supposed to prevent this situation, but it did not. There were no problems, however, loading boot tape files that clearly fit into 16K.

Mantis could be a valuable utility for a very select group of Assembly Language programmers: those who develop boot tapes for 16K systems, and who are very comfortable working in machine language without mnemonics. These few will probably be able to live with the problems of loading oversized programs.

CHAMELEON CRT EMULATOR

Company: APX

Language: BASIC and Assembly

Hardware Requirements: 16K cassette/24K disk

Department: Utilities

Sugg. Retail: \$22.95

Availability: 7

Disk or Tape: Both

OVERALL RATING **B+**
EASE OF USE **B+**
VENDOR SUPPORT **C**

DOCUMENTATION **B**
VISUAL APPEAL **B+**
ERROR HANDLING **C**

RELIABILITY **C+**
USEFULNESS **A**
VALUE FOR MONEY **A**

Chameleon is a telecommunications program that allows an Atari computer to emulate several computer terminals. It also features an optional twenty-four line 80-column screen that displays 40 columns at a time using horizontal scrolling.

Chameleon can emulate a Lear Siegler ADM-3A, Digital Equipment Corporation's VT-52, or "Glass TTY" (the generic terminal), as well as a Test terminal for debugging purposes. The ADM-3A and VT-52 emulation supports the usual cursor features, such as tabs, backspace and form feed, plus a visual bell signal. The program correctly emulates the cursor addressing and editing features for the VT-52 and ADM-3A. But it does not support the VT-52's graphics mode. Other features of *Chameleon* include menu selectable baud rates, input/output parity, and duplex settings. Capabilities for screen dump, upload, and download to or from the program recorder, disk drive, or other devices are supported.

Chameleon has two modes: the Terminal Emulator Menu and the actual terminal emulator. You can move from one to the other by use of function keys. When you first load *Chameleon*, the Terminal Emulator Menu displays the program's default values. The OPTION key moves the cursor from one menu item to another. The SELECT key displays a new value for the current menu item when pressed. The START key sets the menu selections and moves you to the terminal emulation screen.

In the terminal emulation mode the function keys allow you to scroll the screen horizontally left or right, view the previous page of data, and start upload or download procedures. Since the Atari 400/800 cannot simultaneously receive data from the modem and send it to the disk drive or program recorder, *Chameleon* uses a procedure called "XON/XOFF flow control" to temporarily stop transmission of data from the other computer while the Atari writes the data out to disk, cassette, or printer. Most computer systems have this feature: but if you are thinking of using *Chameleon* to communicate with one particular computer, you should find out if it has "XON/XOFF flow control." (Both *Comuserve* and *The Source* offer this feature.)

Chameleon will work with any modem or other RS-232 device that is connected to port 1 of the 850 interface module. The manual is well written, using comprehensible examples. Source code is included with the disk version, and the manual has limited instructions on how to customize the program. The 80-column feature is very useful for communicating with mainframe computer systems which often assume 80-column terminals are on the other end and so format their output accordingly.

Error handling, unfortunately, is less than ideal in *Chameleon*. For example, a single character is displayed when a file error occurs. To find out what the error is, you must look the character up in a table in the manual. Luckily, the program is well enough engineered that errors are infrequent. The terminal emulation mode is especially useful if you need to communicate with a computer system, such as the DEC timesharing systems, which have special programs specifically designed for VT-52s.

Overall, *Chameleon* provides extensive communication features at a minimal cost. In addition, advanced users can use *Chameleon* as a base if they need to write a specialized communications program.

KEYPAD CONTROLLER

Company: APX/Atari Program Exchange

Language: BASIC and Machine

Hardware Requirements: 8K cassette; 24K diskette

Department: Utilities

Sugg. Retail: \$15.95

Availability: 7

Disk or Tape: Both

OVERALL RATING	A-	DOCUMENTATION	B+	RELIABILITY	A
EASE OF USE	B+	VISUAL APPEAL	C	USEFULNESS	B
VENDOR SUPPORT	A	ERROR HANDLING	B	VALUE FOR MONEY	A

Thomas Newton's *Keypad Controller* utility lets you use up to two twelve-button Atari keypads. The use of the keypads enables one-touch commands or entries, and keypad applications are many. One-touch cursor controls, insertions, deletions, and clear screen commands are some of the useful additions you can make. The program is also very helpful in applications where simplifying input is desired, as in programs for kids.

The keypads are plugged into the last two joypoints, hence joysticks and paddles can also be used. The program works with both the BASIC and the Assembler Editor cartridges. At boot up, it installs itself in memory until the power is shut off. Each keypad must then be toggled "on" or "off" with a Shift Control sequence. In addition to controlling keypads, the program also allows you to vary the speed of the screen or printer listings using other Shift Control sequences.

Keypad Controller offers great flexibility in customizing keypads to your program's needs. Default assignments are given to each keypad button, but the program also includes a file which allows you to easily re-assign the buttons to any common key (i.e., letters, RETURN, graphic symbols, or Atari key), or key sequences such as cursors, lower caps, or clear screen. Your new keypad assignments can be permanently stored as BASIC subroutines or in binary files for inclusion in your programs.

These custom keypad subroutines included in your BASIC program work well, and the author provides code which eliminates the need for the manual off/on toggle. However, the keypad program does have some limitations. The copy and duplicate disk options of DOS will not work if the program is in memory. If the run cartridge option of DOS is used, the System Reset must be hit to reactivate the keypads. The program should also be toggled off prior to removing the keypads in order to prevent random garbage from being printed. Despite these limitations, I recommend the program because it is easy to use, flexible, and allows yet another powerful method of input for your computer.

STAT PLUS

Company: The Programmer's Workshop

Language: BASIC

Hardware Requirements: 32K

Department: Utilities

Sugg. Retail: \$49.95

Availability: 6

Disk or Tape: Disk

OVERALL RATING

C-

DOCUMENTATION

D

RELIABILITY

C

EASE OF USE

D+

VISUAL APPEAL

C

USEFULNESS

C-

VENDOR SUPPORT

C

ERROR HANDLING

C

VALUE FOR MONEY

C-

One of the classic applications of computers is the calculation of statistics. *Stat Plus* attempts to extend this traditional capability to Atari users. The package has modules to perform the following:

- calculate mean, variance, and standard deviation
- calculate probability using binomial, poisson, or normal distribution
- check significance using t-test, Mann-Whitney U test, and chi-square test
- do linear or multilinear regression analyses

An interaction menu allows you to use several statistical treatments on a given sample while the sample is still in RAM. Other convenient features allow storage and retrieval of samples from disk, editing and ranking of samples, and printing of samples or test results to the screen or to an optional printer. The choice of statistical tests, documentation examples, and references make it clear that *Stat Plus* is oriented toward psychological statistics.

The author obviously tried to make *Stat Plus* easy to use. Every input has some kind of prompt, and there are many on-screen instructions and error messages. Unfortunately, there are still many irritating little problems. The program diskette must be in the drive in order to return to the Main Menu; if it is not, the program is lost and the system must be rebooted. Printing is done either to the screen or the printer, but not to both. Since the package can handle up to twelve variables, some of the output is naturally too wide for a 40-column screen; the format chosen to represent this output on the screen is very hard to read. Graphical output would have been useful, especially for the regression analyses. Most of the error messages stay on the screen long enough to read, but a few of them flash by so quickly that I am not really sure they were error messages. One apparent bug gave me a "memory insufficient" message (on a 48K system) while working with a very small sample.

The most serious problem with using *Stat Plus* is in its documentation. While it is physically attractive and easy to read, the 32-page manual simply does not provide enough information to use the program effectively. Plenty of examples are provided, but the explanations stop short where the "answers" are given by the computer. Many of these answers have to be interpreted using tables found in statistics texts, but neither the program nor the manual gives any hint of this requirement. Ideally these tables should have been incorporated into the program, but failing that, they should have been printed in the manual along with an explanation of their use.

Some apparent shortcomings of the program may have been problems with the documentation. For example, if there is a way to run a Mann-Whitney U test with *Stat Plus* on a pair of samples of unequal size, it is not obvious from either the program or the documentation. The results of the U test are presented in a way totally different from that found in one of the references, *Statistics for Psychology*, by Mendenhall et al. (An outstanding text, by the way.) With no explanation in the documentation, these results could not be reconciled with those in the book.

Stat Plus is a pretty good start on a psychology statistics package. Unfortunately, its usefulness will be seriously limited until the documentation (or better yet, the program) is modified to incorporate the tables needed to finish the calculations.

CALCULATOR

Company: APX/Atari Program Exchange

Language: Machine

Hardware Requirements: 24K

Department: Utilities

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Disk

OVERALL RATING

B -

DOCUMENTATION

A

RELIABILITY

A

EASE OF USE

C

VISUAL APPEAL

C

USEFULNESS

B

VENDOR SUPPORT

C

ERROR HANDLING

A

VALUE FOR MONEY

B -

Calculator turns your computer into a programmable pocket calculator with 145 functions ranging from simple arithmetic operations and conversions to complex mathematical, statistical, and financial functions. The program is indeed powerful, having the ability to work in either Reverse Polish Notation (RPN) or Algebraic. In addition to default decimal values, it will accept Hexidecimal and Octal numbers. You can choose to display numbers in up to eight decimal places. Large and small numbers are displayed in floating point notation. The program can save and load numerical data from disk or tape, and it will give a hard copy of all operations using any of the Atari printers (and Epsoms, too).

While people who are accustomed to working with programmable calculators, particularly those who use RPN on HP calculators, will find *Calculator* easy to adapt to, others will find the program cumbersome.

First, the display and all operations are register and stack oriented. There is an X register where the answer is displayed, a Y register, and a stack. The stack is for temporary storage of up to 42 numbers, of which 9 are displayed. The stack isn't like a memory location, in that numbers are pushed onto the stack like dishes being piled up, and, when needed, are pulled off the stack. There are 100 memory locations for storing numbers. The first ten are displayed.

Second, all entries are made in small one step operations, in much the same way as one uses a real calculator; for example, if you wished to do the following calculation in the Algebraic mode, $6 + (1 + 7)$. This is entered in five separate steps, each on a separate prompt line. First you enter "6 * " then "(" then "1 + " then "7)", and finally " = " to get the final answer in the X register. The last seven operations are displayed above the prompt line in a scroll area. Most functions are accessed by one or more mnemonic commands. For example, ROOT takes the square root of a number, and SUM adds the contents of the X register to a memory location that you specify. There are so many commands that the manual is a book 190 pages long. It includes a large number of financial and scientific examples, most of which can be programmed into *Calculator* for repetitive calculations.

I often question the value of a programmable calculator. Certainly it is easier to use for many people who refuse to learn how to program similar operations in BASIC; but learning to use the programmable functions of *Calculator* isn't that much easier. It does have an advantage in that many of the business and statistical functions would be hard to duplicate in BASIC without extensive programming features; but most of these features are available on an actual calculator, at comparable prices, which are easy to operate using single labeled keystrokes. I think what bothers me most is that I have to use desk calculators on other microcomputers. This one is far too complex for the average user.

THE ATARI 5200

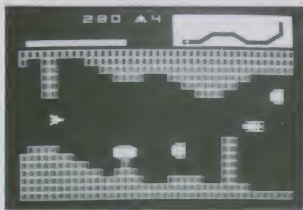
One of the most important manufacturing trends in the 1983 year was the release of the Atari 5200. Retailing at \$169.95, this second generation game machine is designed to replace the five year old 2600 system. It offers improved graphics and a larger selection of more complex software, comparable to that offered in the arcades and on other home computer systems. A non-expandable unit, it was designed to appeal to game enthusiasts who desire a reasonably priced system. With its new 2600 (VCS) game adapter, many of the estimated eleven million owners will upgrade to a better system, but other than for the purpose of consolidating the two machines, I wouldn't expect many to purchase the adapter since the price difference between the adapter and a brand new VCS is not great.

The 5200 has a very streamlined appearance. The case is smoked black plastic with a metallic silver trim. A concealed lid toward the back houses the two controllers when they are not in use, and the unit blends smoothly into either an office or home setting.

The two controllers combine a 360-degree analog joystick with a twelve-button keypad. With this you can play more complex games. The controller has trigger buttons on both sides, so that both left and right-handed players will be equally comfortable. The unit also has Reset, Pause, and Start switches. The joystick is analog rather than the old switch type. This not only allows for faster cursor positioning, but also lets you accelerate movement dependent upon the joystick's position relative to its center. While joystick control is fair to good, games that require accurate and smooth paddle positioning like *Super Breakout*, handle terribly. And because the pin configuration is both larger and noticeably different, the system isn't interchangeable with regular joysticks.

Joystick reliability on the 5200 is weak. Quite often the side trigger buttons fail to function. There is no way to fix this since the switches apply pressure to a flexible, plastic coated wiring harness or circuit. The warranty is made void if you open the case, and for good reason—you'll probably never replace the unit since the wire harness pulls out and the stick releases the twin cam mechanisms.

The games and graphics available for the 5200 compare favorably to those for the Atari 400 and 800 computer systems. No surprise, since the internal machine resembles an Atari 400 with a redesigned Pokey I/O chip and a slightly altered operating system. The unit comes packaged with the *Pac-Man* cartridge featuring all of the cartoon intermissions. Many popular Atari 400/800 cartridges like *Star Raiders*, *Centipede*, *Defender*, *Missile Command*, *Galaxian*, *Asteroids*, and *Dig Dug* are also marketed for the 5200 (see these game reviews elsewhere in this book). Also available is a series of outstanding sports games which we have reviewed here as well. Of note is a baseball game soon to be released which incorporates a speech synthesizer, allowing the umpire to audibly call the pitches. While third party game cartridges are just showing in the market, such classics as *Miner 2049er*, *Frogger*, and *Q*bert* are available to run on your 5200.



VANGUARD



SOCCER

VANGUARD

Company: Atari

Language: Machine

Hardware Requirements: 5200

Department: Entertainment

Sugg. Retail: \$40.95

Availability: 9

Disk or Tape: Cartridge

OVERALL RATING **B**
GAME CONCEPT **B**
CREATIVITY **B-**
GAME DEPTH **B+**

CONTROLLABILITY **B-**
SKILL INVOLVED **C**
CHALLENGE **B**
GRAPHICS **B-**

ERROR HANDLING **N/A**
DOCUMENTATION **C**
HOLOS INTEREST? **B-**
VALUE FOR MONEY **B**

Atari did an admirable job in translating the coin-op version of *Vanguard* to the 5200. The game is an intense shoot-'em-up that takes place in a long underground scrolling tunnel consisting of many different zones. Your ship remains under continual attack, but you can defend yourself by shooting in any of four directions using a unique firing mechanism. Although you are forced to fly forward due to the constant scrolling, you shoot in the direction that you maneuver your ship. This technique often endangers your ship, especially in the Rainbow Zone, but it gives you more scoring possibilities. This aspect of the game differs greatly from the four button firing mechanism used in the coin-op version.

All the sections of the tunnels are different. In the first, flying across an energy pod makes your ship invulnerable for a period of time. Your ship can safely ram the enemy, but the firing mechanism is disabled. The theme from the movie *Flash Gordon* plays through this sequence. The Styx Zone has numerous obstructions along its tunnel. You must fly carefully while clearing a path through the enemy formation which advances and fires on your position. The Rainbow Zone is perhaps the hardest because of the constant barrage of balloons that surround your ship. These zones occur on the three diagonals in the tunnel. The Stripe Zone is full of obstacles, yet the Bleak Zone is wide open flying. And if you finally manage to reach the Gond in the last zone, you can blow it up.

The game is action-packed and rarely lacks targets. The long tunnel is hard to complete with only five ships. However, you can continue where you last left off by pressing the trigger rather than the Start button which resets the score to zero. This is an endearing feature to those who are curious and wish to see the entire tunnel the first time they play. The graphics are nearly as good as the coin-op version, but with a lot less color. The music from *Flash Gordon* complements the game, and I'm certain that even the hardened arcade fan will like this home computer version of *Vanguard*.

COUNTERMEASURE

Company: Atari

Language: Machine

Hardware Requirements: 5200

Department: Entertainment

Sugg. Retail: \$32.95

Availability: 6

Disk or Tape: Cartridge

OVERALL RATING **C-**
GAME CONCEPT **B-**
CREATIVITY **C**
GAME DEPTH **C-**

CONTROLLABILITY **C-**
SKILL INVOLVED **C-**
CHALLENGE **C-**
GRAPHICS **B-**

ERROR HANDLING **N/A**
DOCUMENTATION **C+**
HOLOS INTEREST? **D+**
VALUE FOR MONEY **D+**

Terrorists have captured an American missile silo complex and threaten to blow up Washington, D.C. As tank commander, your job is to destroy all seven silos in the complex before the deadline. Terrorist-controlled pillboxes surround each silo, equipped with randomly firing mobile turrets and aided by remote controlled tanks and jeeps. While under fire from these defenses, your joystick-controlled tank negotiates terrain ranging from open fields to wooded hills and towns, stopping occasionally at refueling depots. Because the depots lie close to the pillboxes, they are vulnerable to your fire. You cannot afford to destroy them because they contain clues to disabling the launch sequence timer, each one giving you one letter of the three-letter code. When the timer begins its final countdown, you have less than sixteen seconds to punch in the code before the missiles reach the capital. Of course, you could get lucky.

Countermeasure, basically a simple shoot-'em-up game, requires some strategy. The graphics, which feature detailed scrolling terrain, are good. Unfortunately, the time limit keeps you from getting very far into the game, and the action plods along.

SOCCER

Company: Atari

Language: Machine

Hardware Requirements: 5200

Department: Entertainment

Sugg. Retail: \$32.95

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING	A	CONTROLLABILITY	B-	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	B	DOCUMENTATION	C+
CREATIVITY	B	CHALLENGE	B+	HOLOS INTEREST?	A
GAME DEPTH	B	GRAPHICS	B	VALUE FOR MONEY	A

The *Soccer* cartridge for the 5200 is an outstanding sports simulation for one or two players. It features a very large scrolling playfield with five players, four fielders, and one goalie on each team. You control one player at a time, so team members who don't have the ball are programmed to follow the play action. The goalie handles the net exceptionally well, but you have no control over him. He will stop most shots except a high offside kick to the net's corner.

Each player controls only one detailed and animated player, indicated by a brighter team color. That player can dribble the ball down field using the joystick, or pass by kicking. You can choose low, medium, or high kicks with the keyboard controller. The ball has a shadow so you can tell when it is lofted into the air. The effect is even more dramatic when the goalie makes a save and kicks it high into the air towards the center of the soccer field. It even bounces several times. The defensive player can switch the man he controls by pressing the Switch Player button on the keyboard. It usually switches to the person closest to the player dribbling the ball. When the ball goes out of bounds, the players move into position for a throw-in or corner kick.

Soccer is best played with two players, although one player can play against the computer on any of three levels. The game is played in halves that are adjustable from five to forty-five minutes. The game has excellent graphics, smooth play, and is exciting and engrossing to play. If you like sports games, this is the definitive soccer game on the market.

TENNIS

Company: Atari

Language: Machine

Hardware Requirements: 5200

Department: Entertainment

Sugg. Retail: \$32.95

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING	A	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	B+	DOCUMENTATION	C+
CREATIVITY	B	CHALLENGE	A-	HOLOS INTEREST?	A
GAME DEPTH	B	GRAPHICS	A-	VALUE FOR MONEY	A

Tennis for the 5200 is the best tennis cartridge around. It offers you an arsenal of different shots that you select with the keyboard controller. The nine number keys are set in the same pattern as your opponent's side of the court. This reintroduces the element of strategy that other tennis games lack, letting you draw your opponent out of position, move up to the net, and smash the ball down the opposite alley. You maneuver the players around a detailed court by using the joystick. To return a volley, you simply move the character in front of the ball to hit it. You might have some problem remembering to press the right button without taking your eyes off the ball, but not to worry—if you miss, the ball either repeats your last command or returns to center court at medium speed. Serving the ball is also realistic. You lob it high into the air and hit it into your opponent's service area with moderate force, either to his forehand or backhand. The ball's shadow lets you know its height.

You can play *Tennis* against a human or computer opponent. I would recommend practicing only against the computer, as playing against it can bruise your ego. Because your computer-controlled opponent is programmed to always follow the ball, he rarely misses. With practice, you can play with the skill and strategy of a tennis professional. Although you can't ever hit into the net or out of bounds, you might appreciate this lack of realism because it removes much of the frustration associated with tennis. It may even be the reason that you moved indoors to play *Tennis* in the first place. Whether you watch or play, this game is exciting. Playing it on my six-foot screen was like watching the Wimbledon finals. *Tennis* is truly an outstanding sports cartridge.

MS. PAC-MAN

Company: Atari

Language: Machine

Hardware Requirements: 5200

Department: Entertainment

Sugg. Retail: \$35.95

Availability: 6

Disk or Tape: Cartridge

OVERALL RATING

A

CONTROLLABILITY

C-

ERROR HANDLING

N/A

GAME CONCEPT

A

SKILL INVOLVED

B

DOCUMENTATION

B

CREATIVITY

A

CHALLENGE

A

HOLDS INTEREST?

A

GAME DEPTH

B

GRAPHICS

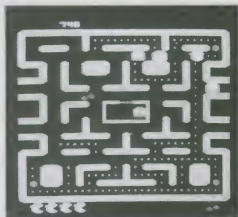
A-

VALUE FOR MONEY

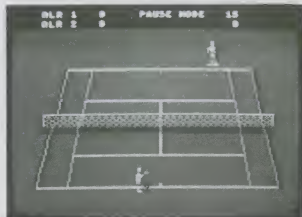
B+

Ms. Pac-Man faithfully recreates the popular coin-operated version. Unlike the *Pac-Man* cartridge, the maze does not fill the screen but instead is nearly square with black margins. The cartridge contains all four mazes and at least three cartoon intermissions. The female dot-eater, adorned with a bow and ribbon and long eyelashes, must outwit four friendly ghosts to munch all of the dots on the maze floor. The dot energizers in the corners let you momentarily turn the tables on Inky, Blinky, Pinky, and Clyde. Bonus fruit wanders throughout the differing maze levels, and the maze has four crossover exits. Any ghost patterns are nearly useless in this game.

You may have trouble controlling things and find yourself running into the ghosts more than once. Most of the trouble develops at slower speeds in the easiest levels. Once your heroine begins to speed up on the more difficult levels, the control problems smooth out. The translated version for home computers works better, but still can't match the reliable control of the original *Pac-Man*. Despite this, I thought the game exceptionally well done, with excellent graphics. It runs smoothly, with no flickering, and should achieve the popularity of the arcade version.



MS. PAC-MAN



TENNIS

VCS GAMES

MR. DO

Company: Coleco

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING

B+

CONTROLLABILITY

B

ERROR HANDLING

N/A

GAME CONCEPT

A

SKILL INVOLVED

B

DOCUMENTATION

B

CREATIVITY

A-

CHALLENGE

B

HOLDS INTEREST?

A

GAME DEPTH

B

GRAPHICS

B-

VALUE FOR MONEY

B

Mr. Do is an arcade strategy game that has enough options to allow you to play the game your way. The object is to help Mr. Do harvest an orchard of apples by mowing or tunneling paths through the grass. Two bad guys are hot on his tail, intent on killing him. You have two options in dealing with the monsters as you try to elude them. If one is following you, you can tunnel up beneath an apple and, by moving clear, let the falling apple crush the bad guy. Mr. Do can also fight back with a power pill launched by aiming your joystick. The power pill will bounce around in the tunnel and kill one of the bad guys. The bad guys aren't all that defenseless. They can transform into Blue Chompers and dig their own tunnels through the grass. You don't have any option here but to wait until they get close and bop one with your power pill. In addition, Alpha Monsters occasionally appear. Each is one letter of the word EXTRA. When you kill all five monsters, you earn an extra life. The game advances to the next level when you have either harvested all the apples or killed all the monsters.

Mr. Do is an exciting game and one that plays well. The popularity in the coin-op version stems from its ability to allow each player to play the game in his own style. You can build your own elaborate tunnel system and lure bad guys to an apple core death, or you can methodically kill them with your bouncing Power Pill. Either way requires strategy to obtain the highest scores.

Mr. Do fans will naturally compare the rich graphics in the coin-op version with the VCS version and be disappointed. But the play mechanics are still here and with four skill levels, it is even more challenging than the coin-op version. The easiest level is well suited to beginners who might otherwise shy away from games like these. In sum, I think *Mr. Do* is a very good strategy game that will hold your interest over a considerable period of time.

LOCK AND CHASE

Company: Mattel M-Network

Language: Assembly

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$39.00

Availability: 3

Disk or Tape: Cartridge

OVERALL RATING

B-

CONTROLLABILITY

C+

ERROR HANDLING

N/A

GAME CONCEPT

B

SKILL INVOLVED

C+

DOCUMENTATION

B

CREATIVITY

C+

CHALLENGE

C+

HOLDS INTEREST?

B-

GAME DEPTH

C

GRAPHICS

C+

VALUE FOR MONEY

C+

Lock and Chase is a "gobble-the-dots" game that is very reminiscent of the arcade favorite that we all know (and some of us love). The player assumes the role of a thief, and must collect all the gold bars on the maze without getting caught by any of the four policemen chasing him. Random treasures appear near the center of the screen that offer different bonus points. Once the screen is cleared of gold bars, the thief must escape through the disappearing red door at the top of the maze.

The speed of the game increases with your score. This provides a constant challenge. You earn additional men as you accumulate points; but there is no option to "take it out on the cops," meaning that there are no "power pills." There are good graphics here, and, as opposed to the other well-known version of this game, the policemen do not fade. There is also a two-player option that allows the players to alternate turns, each ending when their thief is captured. The game is enjoyable for the beginner, and a challenge for the hardened gamer.

JAWBREAKER

Company: Tigervision

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 5

Disk or Tape: Cartridge

OVERALL RATING	C	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C-	DOCUMENTATION	C
CREATIVITY	C-	CHALLENGE	C-	HOLOS INTEREST?	C-
GAME DEPTH	D	GRAPHICS	C-	VALUE FOR MONEY	C-

Jawbreaker is another eat-the-dots arcade game. The maze has been substituted with nine parallel corridors of a candy factory. Each of these corridors are interconnected by hallways at each end and by moving gaps between them. You guide a set of teeth around the factory and gobble candy for points. Animated smiling faces guard the factory and must be avoided, except to munch on the vitamin pill in the center. That extra energy allows you to munch the smiling faces and score bonus points.

This is similar to the Atari computer version but much more difficult: there are more dots, more corridors, and fewer power pills. The graphics may not be comparable to the computer version, but they're not bad in themselves. The game has two speeds and can be played by either one or two players.

MS PAC-MAN

Company: Atari, Inc.

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$29.95

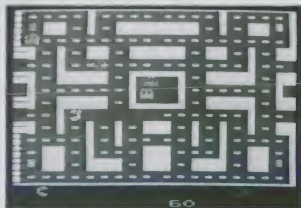
Availability: 10

Disk or Tape: Cartridge

OVERALL RATING	A	CONTROLLABILITY	B+	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	A-	DOCUMENTATION	B
CREATIVITY	B+	CHALLENGE	A-	HOLOS INTEREST?	A
GAME DEPTH	B	GRAPHICS	B	VALUE FOR MONEY	A-

Ms Pac-Man is an exceptionally well done version of the popular arcade game. This time a female Pac-Man, complete with decorative ribbon, eats the dots in the maze. Our four ghost friends, Inky, Blinky, Pinky, and Clyde, join the chase to corner our heroine before she eats all the dots on the maze floor. The maze is different from the *Pac-Man* version; it has two tunnels on each side and the fruit wanders around the maze instead of remaining stationary.

The graphics are fine in this version. The ghosts blink only a bit and only when two or more are on the same line. Fortunately, the programmers have learned several good techniques to avoid the horrible flickering that blighted the *Pac-Man* VCS cartridge of last year. Joystick control is very responsive, and there are no complaints in game play. If you like maze games, *Ms Pac-Man* is the best of its type on the VCS to date.



MS. PAC-MAN



FOOTBALL

REAL SPORTS FOOTBALL

Company: Atari

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$30.45

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

A
A
B
A-

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

A
B
B
B+

ERROR HANDLING
DOCUMENTATION
HOLDS INTEREST?
VALUE FOR MONEY

N/A
B+
D
A

Real Sports Football is an outstanding VCS sports simulation for one or two players. Each team consists of five players, one of them directly controlled by your joystick. If offense, you control the quarterback; if defense, the safety. The other players follow the movements necessitated by the selected play. You choose the play by moving the joystick in the required direction. A flashing indicator at the top tells you if a play hasn't yet been chosen. The offense can choose long or short passes (left or right), running plays (left or right), or kicking. The defense can cover short or long pass plays and anticipate the direction the play will move. Once the quarterback throws, the ball travels automatically. Control then switches to the eligible receiver, who you move to catch the pass. The defensive player has slightly more speed than the ball carrier, and can usually tackle him on a short run. He encounters more trouble against a long lead. Running plays against the computer are difficult, and your best bet is to tangle the linebackers with blockers.

The game follows the rules of football fairly closely. Exceptions are no kicking for extra points, no time out, no fumbles, no penalties, and no running out-of-bounds. The clock runs continuously during play and stops after incomplete passes. It also stops for scores, turnovers, dead balls, and while the offense calls the play. It resumes with the hike. The clock won't stop for more than thirty seconds, so you cannot intentionally delay the game. You can play at one of two difficulty levels, both of which control the runner's speed. This helps balance the contest between unequal opponents.

The graphics are quite good in this game. The screen shows only about twenty yards of field, but the ten yard lines scroll as the ball carrier moves down the field. The players are animated when they run, and although noticeable flickering occurs during play, I did not find it bothersome. Game play is surprisingly good, and offers enjoyment over an extended period of time. I would definitely recommend the game to football fans, as it may well be the best sports simulation cartridge available on the Atari VCS system.

REAL SPORTS SOCCER

Company: Atari

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$30.45

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

D
C
D
D

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

C
D+
C-
C

ERROR HANDLING
DOCUMENTATION
HOLDS INTEREST?
VALUE FOR MONEY

N/A
B
D
D

Real Sports Soccer disappointed me with its lack of realism. Three players make up each of the competing teams, sans goalie. You control one player at a time; the rest drift after the action. You try to bluff, pass, and out-manuever your opponent to get near your goal. To score, you simply have your player kick the ball into the empty net.

You control your player by joystick. When on the defensive, you can change players by pushing the button. If on the offensive, you can pass to your opponent by pressing the button and pushing the joystick in the desired direction. The soccer players look realistic and are animated when they run. The playing field, about three screens wide, scrolls as the game moves. Unfortunately, *Real Sports Soccer* fails to copy the real game; it lacks the complexity and players to hold anyone's interest.

REAL SPORTS VOLLEYBALL

Company: Atari

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$30.45

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING	C+	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	C+	SKILL INVOLVED	C	DOCUMENTATION	B
CREATIVITY	C	CHALLENGE	B	HOLOS INTEREST?	C
GAME DEPTH	C	GRAPHICS	C	VALUE FOR MONEY	C

Real Sports Volleyball simulates beach volleyball, in which just two players make up a team. Your perspective is high and from the side, the players in profile. The net runs down the middle of the screen from top to bottom, and the ocean lies in the background. You control the players with a joystick.

The two players of each team seem to move in tandem on their half of the court. You need only position the player under a descending ball for him to hit it. If the player stands very close to the net, pushing the button enables him to spike the ball. The shadow under the ball helps you determine how high it is and thus calculate the proper hit. You can play the game against the computer or a human opponent, with a choice of two play levels. On the harder level, your players must hit the ball twice before sending it back over the net to the opposing team.

Scoring is very realistic. Only the team that serves can score points; if the other team wins the volley, they gain the right to serve. The first team to score fifteen points wins the game. With a little practice, people who like beach volleyball can happily play this indoor substitute on a rainy day.

REAL SPORTS BASEBALL

Company: Atari

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$30.45

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING	B	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C+	DOCUMENTATION	B+
CREATIVITY	B-	CHALLENGE	C-	HOLOS INTEREST?	B-
GAME DEPTH	B	GRAPHICS	B	VALUE FOR MONEY	B-

Real Sports Baseball, a very playable and well-designed baseball game, features one or two players in competition, a nine-player team, batting and pitching control, base stealing, and the ability to throw the ball around the infield with complete control. The well-done graphics show a perspective of the field from above and behind the plate. The outfield looks shallow, but you can't have everything. The pitcher throws four different pitches: a fastball, riser, sinker, and an intentional pass to walk the batter. Unfortunately, the batter can't judge the pitch very well although he can use the joystick to adjust his swing. He can hit high or low to either left or right field, bunt, and easily hit a home run. When running the bases, the player can advance or retreat, even steal. Outfielders can field grounders, or catch fly balls. Choose the proper base to throw to by pushing the joystick in one of four directions (the same as for the pitcher; up for second, left for first, and so on). If the intended receiver misses the catch, the ball rolls and comes to a stop on the field. You just move your player over to pick up the ball and hope you have enough time to tag the runner out.

The game possesses four variations, two one-player games and two two-player games. The major difference is that in the former, the batter can attempt to hit any pitch, while in the latter, he can't hit balls outside of the strike zone. The game's graphics have vastly improved over the old *Home Run* cartridge. The baselines are brown against the green grass field, and the players are animated when they run. While not the best baseball, the game is very playable. Not a disappointing cartridge at all.

PAC MAN

Company: Atari

Language: Machine Language

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$37.95

Availability: 10

Disk or Tape: Cartridge

OVERALL RATING **D+**
GAME CONCEPT **B**
CREATIVITY **B**
GAME DEPTH **B**

CONTROLLABILITY **F**
SKILL INVOLVED **D+**
CHALLENGE **C**
GRAPHICS **D-**

ERROR HANDLING **N/A**
DOCUMENTATION **C**
HOLDS INTEREST? **C**
VALUE FOR MONEY **D+**

In an effort to reproduce the all-time favorite *Pac-Man* arcade game, Atari has fallen far short of expectations. If you have played the arcade game, the home version will be very disappointing. Limited graphics is the factor in its poor showing, causing all the characters to flicker. The second disappointing aspect of the home version is the very poor controllability allowed by the joystick.

The game is played basically the same as the coin-op version. Your Pac-Man moves about a maze, scoring points by eating video wafers. Four ghosts pursue you, and any contact (or even close encounters) with them proves fatal. There are, additionally, four power pills (one in each corner of the maze) that when eaten by Pac-Man allow you to turn the tables on the ghosts: for a limited time, you may eat them instead. Music signals the length of time you can pursue and destroy them. You score 200 for the first, 400 for the second, 800 for the third, and finally 1600 on the fourth. These high point scores are awarded only if they are all eaten in the short period permitted by the power pill's effects. You are provided four Pac-Men at the start of the game.

Vitamins, worth a higher score when consumed, appear periodically near the center of the maze. After the ghosts change colors (indicating an increased level of difficulty) a higher score is obtained after eating each successive ghost. Ideally you consume all four for the highest point totals.

The eight game variations deal with the relative speed of your opponents. The setting ranges from a crawling child's speed to that equal of your Pac-Man.

Game conception and creativity are the strong points, but the sorrowful control of your Pac-Man, and limited graphics, detract from its overall appeal.

CHOPPER COMMAND

Company: Activision

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$31.95

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING **A-**
GAME CONCEPT **B+**
CREATIVITY **B**
GAME DEPTH **B**

CONTROLLABILITY **B**
SKILL INVOLVED **B+**
CHALLENGE **A**
GRAPHICS **A**

ERROR HANDLING **B+**
DOCUMENTATION **A**
HOLDS INTEREST? **A**
VALUE FOR MONEY **A**

Chopper Command is a one or two player shoot-'em-up in which you command a helicopter whose mission is to defend a convoy of trucks from a pernicious swarm of enemy fighters and helicopters. Joystick control is very sensitive in this game, and may take a bit of getting used to. But once you get a feel for the helicopter's responsiveness, maneuvering it becomes very simple. It may also take a bit of time to cope with the "radar scanner" on the screen below the battlefield; this shows your position, the position of the enemy aircraft, and the position on the ground of the trucks you are defending.

You begin with three helicopters, and bonus helicopters are awarded for each 10,000 points that you score. There is a beginning and an advanced playing mode. Enemy aircraft come at you from both sides, firing multi-warhead missiles which split in two, one half aimed at you and one half aimed at the trucks in convoy. You must avoid these or shoot them down, and knock out the enemy aircraft with your laser cannons as they approach. Plus you must avoid crashing into your own trucks. Once you've cleared the skies of enemies, bonus points are awarded based on the number of trucks that survived the attack. Then you advance to the next level of play. The game will continue indefinitely, or until all of your helicopters are destroyed, whichever comes first.

If addition to a game is any indication of how good that game is, then I found this game to be very good. In my experience, virtually all of the Activision games have excellent graphics, and *Chopper Command* is no exception. The documentation is also very good, including playing hints from the program's author. This game is definitely worth the trip.

SUPER COBRA

Company: Parker Brothers

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING	B	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	B-
CREATIVITY	C	CHALLENGE	B	HOLDS INTEREST?	B-
GAME DEPTH	B	GRAPHICS	C+	VALUE FOR MONEY	B

You are the pilot of an attack helicopter doing surveillance over 10,000 miles of scrolling enemy territory in *Super Cobra*. The enemy has ground artillery, rockets, mines, fireballs, and fuel depots throughout its territory. As the screen scrolls, you maneuver your joystick-controlled helicopter over mountains and through narrow tunnels. Some of these passageways are so narrow you must alternately accelerate and decelerate to maximize your vertical movement. This navigational technique takes practice. Your helicopter is equipped with both missiles and bombs that fire alternately. This makes it much harder to hit the fuel depots with bombs.

There are eleven scrolling sections to the game. The first few are fairly easy; ground artillery and rockets don't begin firing simultaneously until level four. The flying fireballs fly in predictable patterns, but when the mines begin dropping bombs in level seven, things get difficult. The goal is to eventually reach level eleven and pick up the booty by swooping down and landing on it. You get four choppers, but I guarantee you will never reach level eleven with just those four. However, you can eventually reach higher levels by pressing the fire button immediately after the game ends, so you start at the beginning of the last level next time you play. I have known people who have played this game for over an hour in order to reach the end.

The game is interesting, exciting, and has good depth to hold your interest. The graphics are fair, but the scrolling is a little jerky. The terrain is cubic with horizontal lines delineating the solid areas. The bombs fall straight down, rather than arc.

DEFENDER

Company: Atari, Inc.

Language: Assembly

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$37.95

Availability: 9

Disk or Tape: Cartridge

OVERALL RATING	B	CONTROLLABILITY	C-	ERROR HANDLING	B
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	B
CREATIVITY	C+	CHALLENGE	C+	HOLDS INTEREST?	B-
GAME DEPTH	C+	GRAPHICS	C-	VALUE FOR MONEY	B-

Defender is an airspace battle game designed for one or two players (the two-player version alternates turns and compares scores).

Your mission in *Defender* is to protect your home city and its inhabitants from a continual alien onslaught. Your arsenal includes a laser cannon, and a limited supply of smart bombs (3 at the start of play). The laser cannon is fired in normal flight by using the joystick button. To explode the smart bombs, you need to fly alien vessels pictured on the screen. You can gain additional smart bombs every time you score 10,000 points, or multiples thereof.

You can increase the difficulty in other game selections, increasing the speed of the attacking fleet, and making the attacks and confrontations more frequent. Because of the limited graphics of the cartridge system, don't expect this to be an exact copy of the arcade game. The aircraft and aliens flicker, but the actual combat and theme are the same.

Another feature is the radar scanner at the top of the screen, which displays the position of all the aliens and the humanoids in relation to you. It is an aerial view that lacks much detail, and, in the heat of the battle, becomes a distraction. One good escape maneuver is the use of hyperspace warp. This you engage by going off the top of the screen and pressing the fire button. The landing ships swoop down and attempt to carry off your human inhabitants. If they successfully fly off the top of the screen with their captives, the humans will return as mutants and fight against you. The highest point values are scored by shooting these ships and then picking up the falling humans and gently depositing them back in the city (they can also free-fall to safety at the lower altitude levels).

SOLAR FOX

Company: CBS Electronics
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: \$25.00
Availability: 4
Disk or Tape: Cartridge

OVERALL RATING	D	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	D+	SKILL INVOLVED	D	DOCUMENTATION	C
CREATIVITY	D	CHALLENGE	C-	HOLOS INTEREST?	F
GAME DEPTH	D	GRAPHICS	D	VALUE FOR MONEY	D-

In the space game *Solar Fox*, you fly past solar cells arranged in a grid, attempting to collect them before the timer runs out. You must avoid getting shot by two enemy sentinels located at the top and bottom of the screen, but you don't get to shoot back. If you beat the time limit, you get to skip the next rack and win all the points as if you had collected them. You face a challenge rack every six rounds (these pit you against a timer, but no sentinels). If you win the challenge rack, you get a letter clue to a six-letter word. You will tire of this game quickly.

AIR RAIDERS

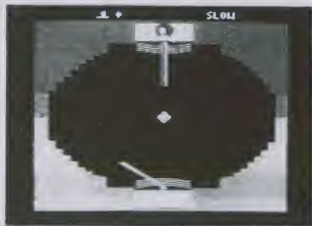
Company: M Network
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: \$30.00
Availability: 4
Disk or Tape: Cartridge

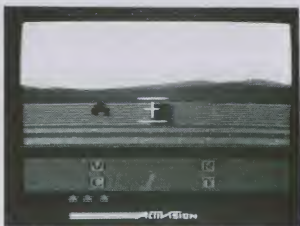
OVERALL RATING	C-	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	D	DOCUMENTATION	C
CREATIVITY	C-	CHALLENGE	D+	HOLOS INTEREST?	D+
GAME DEPTH	C-	GRAPHICS	C-	VALUE FOR MONEY	C-

In *Air Raiders*, an aerial combat game and one of Mattel's better cartridges, you shoot down as many enemy planes as possible without getting shot down yourself. Your plane takes off and gains altitude quickly as you pull back on the stick. The horizon tilts as you bank left or right, and the bar at the bottom of the screen tells you where you are. It also shows you the heavy flak zone that you should avoid. Soon you spot a formation of enemy planes. Sitting ducks, they never turn, fly closer, or defend themselves. You must shoot carefully to conserve your ninety-nine rounds of ammunition, because you can land to refuel only after shooting down ten planes and then only get as many bullets as the number you have shot down. The only hard part of the flight is watching your altimeter so that you don't fly into the ground while chasing enemy planes.

While this sounds exciting, the enemy planes offer no real threat. The only danger comes from the anti-aircraft flak. Too bad this game isn't more challenging—the excellent graphics make flying realistic, but they can't negate the lack of targets and tension. With improvement, the game could be a real winner.



JEDI ARENA



ROBOT TANK

ROBOT TANK

Company: Activision

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$34.95

Availability: B

Disk or Tape: Cartridge

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

B
B
C
C+

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

B
C
C+
A-

ERROR HANDLING
DOCUMENTATION
HOLOS INTEREST?
VALUE FOR MONEY

N/A
C
B
B-

The object of *Robot Tank* is to steer your tank around a desert battlefield in a search and destroy mission. It seems a large number of robot tanks are on the loose and are no longer taking orders.

Your tank is joystick controlled. A radar screen shows the relative position of enemy tanks, while your viewscreen helps you line up the gun turret's crosshairs on the enemy tank. Shooting a tank is simple, you just lead slightly with your gun. The tanks aren't too aggressive. You usually have several chances to nail one before it turns and fires. Their shots are more likely to damage your tank than destroy it. (Your gun turret or your radar or visual scanner may be knocked out.) The appropriate indicator will flash when the tank is damaged. The battle lasts throughout a 24-hour period, meaning you will have to fight at night or in morning fog when the visibility is poor.

The game has excellent graphics and the screen is elaborate. A radar screen and various warning lights grace the bottom. The terrain has a mountainous background and a striped desert floor. The combination of these stripes moving forward, and the horizontally scrolling mountains gives the game a sense of motion. The sky turns from day, to a beautiful sunset, to pitch black as night falls. One of the more unusual effects is the explosion when a tank is destroyed. It looks like an electrical malfunction of the computer.

Frankly, the game wouldn't have been much of a challenge if it weren't for the 24-hour battle cycle giving the player a feeling of progression. Night fighting is dangerous. The enemy tank is alerted to your position when you fire. Since it is difficult to shoot by radar alone, it is best to evade the enemy until dusk. Sometimes daylight weather makes the game challenging. Fog impairs visibility, and rain or snow slows down the tank treads.

Since bonus tanks are awarded for every twelve tanks destroyed, a good player may last indefinitely despite the enemy becoming more aggressive as the game progresses. The game has its moments, but with its minimal strategy the game is nothing more than a nice looking shoot-'em-up game.

JEDI ARENA

Company: Parker Brothers

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$29.95

Availability: B

Disk or Tape: Cartridge

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

C
C+
C
C-

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

C
C+
C
C+

ERROR HANDLING
DOCUMENTATION
HOLOS INTEREST?
VALUE FOR MONEY

N/A
C
C-
C

Jedi Arena represents a light saber battle between two Jedi knights. You try to score three victories over your opponent by directing energy bolts from a roving Seeker against a three-layer force field that acts as armor, chipping away at it. You use the paddle-controlled light saber to aim the bolts of energy, pointing the tip in the direction you wish the bolt to strike. Unfortunately, this leaves you wide open to attack, because you also use the saber to ward off bolts of energy. The game usually alternates between fast attacks and lengthy defense, but you can't wait too long before attacking again because the Seeker builds up energy and then lashes out at both players.

While the graphics lack excitement, the sound effects are realistic and add to the atmosphere of battle. Although a simple game, *Jedi Arena* does offer several levels of difficulty and the option of playing against the computer. It makes swordplay intriguing.



EMPIRE STRIKES BACK



M.A.S.H.

RETURN OF THE JEDI

Company: Parker Brothers

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING

C+

GAME CONCEPT

B

CREATIVITY

C

GAME DEPTH

C

CONTROLLABILITY

C+

SKILL INVOLVED

B

CHALLENGE

B

GRAPHICS

C

ERROR HANDLING

N/A

DOCUMENTATION

C+

HOLOS INTEREST?

C

VALUE FOR MONEY

C

As in the movie *Return of the Jedi*, the objective here is to destroy the sinister Death Star before it is completed. The battle begins some distance from the Death Star as your joystick-controlled ship, the Millennium Falcon, encounters a group of Tie Interceptors heading back to the uncompleted space station. You have no choice but to eliminate them with your laser cannon, for the Death Star's shield prevents you from approaching the Death Star. You also have to watch out for the deadly Imperial Shuttle (containing Lord Vader) which blasts a death ray. Eventually, after shooting down enough Tie fighters, random openings begin to appear in the shield. If you time your entry into one of these holes with the intermittent disappearance of the gray energy band, you can slip through. Upon penetrating the opening, you briefly enter hyperspace and arrive at the Death Star.

Your ship, which is much closer to the enlarged station, can now blast away chunks of the Death Star. The Death Ray now moves back and forth in an attempt to track you while both Lord Vader's shuttle and his squadrons of Tie fighters hunt you down. Your objective is to destroy the station by hitting the central core containing the nuclear reactor. The tactic depends on the difficulty setting. In the easiest mode, you can position your ship diagonally to the station so that you chip away pieces of the station at a safe distance from the Death Ray. However, if you play at the advanced difficulty level, you need to spend most of your time maneuvering your ship to avoid collision, necessitating assault of the station head on. You can do this once the beam fires and misses, because it takes time to reenergize.

The game's theme is well conceived, but it consists of one ridiculously easy level and one extremely difficult level, with nothing in between. The graphics are simple and pleasing initially, but the enlarged Death Star in the second scene is crudely drawn with large irregular blocks. While the ship steers easily during evasive tactics, it is difficult to turn precisely to fire your lasers at the pursuing ship. Since you are likely to collide as you swing around, most players will want to play on the beginner's level. The game is a simple shoot-'em-up with very little depth, but will be exciting to Jedi fans.

THE EMPIRE STRIKES BACK

Company: Parker Brothers

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

C+
C
C+
C-

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

C
C
B-
C-

ERROR HANDLING
DOCUMENTATION
HOLDS INTEREST?
VALUE FOR MONEY

N/A
C
B-
C+

The Empire Strikes Back recreates the attack of the Imperial Walkers on the rebel power generator. You pilot a highly maneuverable snow speeder that fires missiles at the walkers. You try to destroy them before they reach the power generator at the right side of the battlefield, or before you lose all five of your snow-speeders. The walkers approach in single file, making your task slightly easier because you only fight one at a time, but they are hard to destroy under any circumstances. It takes forty-eight direct hits on the body, or a missile directly into one of the three bomb hatches (identifiable by the flashing markers). As the walkers weaken, they change color, and as they slow down, they fire less often and with less accuracy. Even so, they are well armed. They can fire missiles to the rear as well as ahead, and on some levels fire smart bombs that track your speeder.

Your snow-speeder can take five hits before it is destroyed. If damaged, it indicates this by changing color. You can land in a valley for repair only twice. If you manage to keep your snow-speeder functional for two minutes, it begins to flash and you hear the theme song of the rebels. For twenty seconds the Force is with you, and you become invulnerable and able to fire at will until you destroy the walker. The radar screen at the bottom of the field tells you your location on the battlefield, and the view scrolls as you fly.

You will have some trouble learning to fly so that you can hover in front of the walker, and you must become adept to avoid or shoot down the enemy missiles. Four levels of difficulty offer variations that include smart bombs and solid walkers, which you cannot fly through (you can fly through the legs). This requires great skill in flying. *The Empire Strikes Back* obviously can't be won, but it is a fast shoot-'em-up game ideally suited for people who love *Star Wars* and don't mind the lack of depth.

PHOENIX

Company: Atari, Inc.

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 10

Disk or Tape: Cartridge

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

A
A
B
A

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

A
C+
C
A

ERROR HANDLING
DOCUMENTATION
HOLDS INTEREST?
VALUE FOR MONEY

N/A
B
B+
B+

Atari has recreated the *Phoenix* arcade game with surprising detail. *Phoenix* is a five screen invasion game in which a group of embryonic bird-like creatures and their full grown parents attempt to invade your planet from their alien mothership. Your only line of defense against these warbirds are five joystick-controlled laser cannons and limited shields. The object is to defeat each of these invasion groups and then kill the pilot of their mothership.

While game play in the first two rounds against the baby warbirds is much like playing *Galaxian*, battle against the blue and red parents is another story. These beautifully animated flying creatures must be hit directly in the center to kill. Like their ancient ancestors, they will regenerate a missing part if only winged.

The spaceship in part five requires great number of hits to kill. Like *Breakout*, the blocks of the ship's hull must be eroded while the pilot constantly bombards you from above. The pilot rotates so that it takes a while to blast your way through. Your shields are some help, but they only work for a limited amount of time, and you are prevented from moving while they are engaged.

Phoenix is possibly the best invasion-type game on the VCS. The colorful, animated graphics are outstanding. The game has great depth, but is not as challenging as it was obviously meant to be. The reserve birds protecting the mothership during your attack are missing in this version. Nearly everyone, including myself, was able to score a victory the first or second time around. It's a great game but not a very difficult one.

POLARIS

Company: Tigervision

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 4

Disk or Tape: Cartridge

OVERALL RATING C-
GAME CONCEPT C
CREATIVITY D+
GAME DEPTH D

CONTROLLABILITY C
SKILL INVOLVED C-
CHALLENGE C
GRAPHICS C

ERROR HANDLING N/A
DOCUMENTATION C-
HOLOS INTEREST? D
VALUE FOR MONEY D

You are the commander of a submarine in this two screen game. During the first screen, you face three overhead planes that drop bombs and a submarine that is more of a hindrance than a threat. You can pick off the bombers easily because they fly predictable patterns. You can destroy the submarine from below, and should do so before the dive bomber appears. You'll need plenty of running room to dodge its heat seeking missiles, and shooting skill when you rise to the surface because this plane does not fly predictably.

Polaris's second screen tests your navigating ability. The first level offers a repetitive and easily learned channel maze free of mines. On later levels, x-shaped mines dance back and forth, blocking the channel. Hit one and they all disappear. You have no objective in this part of the game. When you finish, you advance to a harder level on the first screen with more bombers and submarines. You face only one skill level, and this coupled with the simplicity and lack of cohesion keep the game from holding your interest.

RIVER RAID

Company: Activision

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$31.95

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING B
GAME CONCEPT C+
CREATIVITY C
GAME DEPTH B-

CONTROLLABILITY B+
SKILL INVOLVED C
CHALLENGE B
GRAPHICS B

ERROR HANDLING N/A
DOCUMENTATION B-
HOLOS INTEREST? B-
VALUE FOR MONEY B

A narrow river cluttered with a slew of enemy bridges, fuel depots, tankers, helicopters, and jet fighters provides the setting for the *River Raid* cartridge. In this shoot-'em-up your joystick-controlled jet fighter skims the water as it destroys everything in sight. Remember, the only safe flight path is above the water. Moving the joystick back and forth banks the plane side to side, while pushing the stick forward and pulling it back changes speed. The object is to shoot everything in sight, or at least avoid colliding with anything crossing your path. The fuel depots can either be shot for points or used for refueling your plane as you fly deeper into enemy territory. You occasionally encounter a bridge which you must destroy to reach the next level. Upper levels contain more targets and fewer fuel depots.

River Raid is a relatively fast action game. The graphics are good, but the game becomes repetitious after long play. It is more a game of evasion than one of real confrontation in the heat of battle.

SPIDER FIGHTER

Company: Activision

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$31.95

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING B
GAME CONCEPT B-
CREATIVITY C
GAME DEPTH B

CONTROLLABILITY B
SKILL INVOLVED B-
CHALLENGE B
GRAPHICS B

ERROR HANDLING B
DOCUMENTATION B-
HOLOS INTEREST? B-
VALUE FOR MONEY B-

Spider Fighter is very reminiscent of the arcade game *Stratovox*. It is a hyper shoot-'em-up game in which the object is to protect three pieces of fruit from spiders and their allies by using your steerable blaster located on the bottom of the screen. There are actually four different types of enemies. The Master Nest is the ringleader of the bunch. The Master Nest is the major fruit thief and it is protected from your poison pellets until it releases a Spy Pod. These critters instruct the Master Nest to release more insects. As long as a Spy Pod exists, the onslaught increases.

The Green Widows, deadly creatures, fly interference for the Master Nest. Finally, Stingers are the most dangerous for they drop hailstorms of laser bombs as they dart all over the screen.

Ten to fifteen seconds into the game one of your enemies will attempt to steal a piece of fruit. You must destroy the enemy before it pushes the fruit all the way over to the far left side of the screen. The game ends when you either lose all of your fruit or run out of cannons. If you manage to save all of your fruit from an insect wave, you are awarded an extra blaster, and you move up to a new fruit level.

Spider Fighter uses an overworked shoot-'em-up theme. However, it is extremely fast and requires hyper reflexes. The colorful graphics and sound effects are what one expects from Activision. I think that anyone who is looking for a real test of skill and likes super fast arcade-style play will find this game to his liking.

FLASH GORDON

Company: Fox Video Games

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 4

Disk or Tape: Cartridge

OVERALL RATING	C+	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	C+	HOLDS INTEREST?	C
GAME DEPTH	C+	GRAPHICS	C	VALUE FOR MONEY	C

Flash Gordon's mission is to rescue allied spacemen trapped inside the underground tunnels of Spider City. The tunnels are filled with Hatching Pods for Spider Warriors, Disrupters, and Patrol Ships, and they are all intent on stopping Flash.

The screen presents a split view of the battlefield. At the top half, Flash's ship and all his enemies are magnified; a map on the bottom half shows the entire layout of the underground city and the location of Flash's ship and his enemies. The ship is maneuvered through the tunnels by joystick. Crosses on the map are Disrupters constantly seeking you out. The screen fills with debris if you enter their fields. It is best to avoid contact with anything and escape quickly. The other screen markers are Hatching Pods. When you touch one with your ship, it hatches five spider warriors that must be killed before they escape. If you kill enough of the spiders you absorb power to activate your shields for several seconds. Shields are helpful for quickly killing your other dangerous opponents—the lone patrol ships.

Flash Gordon is a fair shoot-'em-up game. Not a tough game initially, it does become more difficult as each additional Spider City is conquered. The pace is fast enough to make the game interesting.

M*A*S*H

Company: Fox Video Games

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$14.95

Availability: 5

Disk or Tape: Cartridge

OVERALL RATING	D+	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C-	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	D+	CHALLENGE	D	HOLDS INTEREST?	D+
GAME DEPTH	D+	GRAPHICS	C-	VALUE FOR MONEY	C

At last the TV series *M*A*S*H* has become a video game—unfortunately, without the humor and individual personalities that made it a hit series. You guide an unarmed rescue helicopter onto the battlefield where you pick up wounded troops and transport them back to the operating room. A tank at the bottom of the screen spews shells into the air, but you can't shoot back, you can only avoid getting shot down.

Once you touch down at the 4077th, you become a surgeon. It is time to operate. You must remove the bullet lodged in your patient and move on to the next, having only fifteen seconds to save as many lives as possible. Luckily, the pear-shaped soldiers already have maze-like tunnels throughout their bodies, making it possible for you to guide the bullet out without touching a wall with your forceps.

You can play against a human or computer opponent. Both of you race around the screen in an attempt to rescue as many of the wounded as possible, and from time to time, the scene shifts to the operating room for fifteen seconds. You play for a specific time (999 points) rather than according to how many helicopters have been shot down or how many lives you have saved. Eventually, you just get bored.

SUPERCHARGER AND PHASER PATROL

Company: Starpath

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$49.95

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING

C+

GAME CONCEPT

B

CREATIVITY

C+

GAME DEPTH

C+

CONTROLLABILITY

B

SKILL INVOLVED

C

CHALLENGE

C

GRAPHICS

A-

ERROR HANDLING

N/A

DOCUMENTATION

B

HOLOS INTEREST?

C

VALUE FOR MONEY

B

Starpath's *Supercharger* is an add-on device that increases the VCS's memory from 128 to 6,278 bytes, or fiftyfold. This device is about the size of two cartridges and plugs into the cartridge slot. With its 2K's of ROM it's also like a mini-microcomputer of its own. It essentially improves the screen resolution to that of an Apple or Atari 800 computer, and changes vertical line resolution to 263 lines. The unit's ability to make multi-stage loads from tape allows you to design much more complex games than are normally available on the Atari 2600 game machine.

All the programs (seven at the time of this review) come on cassette tape. The *Supercharger* connects to any standard cassette recorder. Loading tape is usually very slow and difficult, but loading these game tapes is easy. Turn on the unit and a message appears advising you to rewind the tape and press Play. The tapes load under a wide range of volumes and tones, and I never had a bad load even when using J. C. Penny's cheapest recorder. Loads are also fast, about 3,000 baud, or 15 to 20 seconds per game.

The initial unit comes with *Phaser Patrol*, a game like *Star Raiders* that offers excellent high resolution graphics and good play depth. The object is to defeat an armada of Draconian ships that have invaded your part of the galaxy. There are two phases to the game and two screens. The navigational phase takes place on a checkerboard grid of 36 sectors. Each of the sectors either marks enemy starships or friendly starbases, or is left an unknown. You choose your destination sector with the joystick and press the red button to reach it at warp speed—a few flashes of the screen later and you have arrived. The second phase of the game, the battle phase, takes place on a scrolling starfield backdrop. Your radar screen indicates the location of the Draconian attackers from both inside and outside your view screen. Additional sensors show the status of your shields, computer, long range sensors, and torpedoes.

You use a joystick to steer your ship. The stars scroll in the appropriate direction as you attempt to line up your crosshairs with the attacking alien ships patrolling the sector. The torpedo guidance is semi-automatic and will track alien ships. However, when you miss, the enemy has a good chance to cripple your ship. If you sustain damage or run low on energy, you must find a friendly starbase to refuel.

For those looking for a good version of the *Star Raiders* game for the VCS, *Phaser Patrol* is a good choice. Its graphics are far above the competition. The scrolling is smooth, the attacking ships colorful and detailed, and the shields open and close very realistically. The only disappointment in the graphics is the lack of forward motion in space. The game offers a good challenge on either of two difficulty settings, and those who quickly rid the galaxy of the Draconian menace will be rewarded with the highest of sixteen rankings.

ZAXXON

Company: Coleco

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 6

Disk or Tape: Cartridge

OVERALL RATING

D+

GAME CONCEPT

C

CREATIVITY

C-

GAME DEPTH

C

CONTROLLABILITY

B

SKILL INVOLVED

C-

CHALLENGE

D+

GRAPHICS

D+

ERROR HANDLING

N/A

DOCUMENTATION

C-

HOLOS INTEREST?

D+

VALUE FOR MONEY

D+

The VCS version of *Zaxxon* will appall fans of the coin-operated game. The view has shifted from the three-quarter, three-dimensional perspective to one where you fly down the Death Star trench. Because your ship must clear barriers, an altitude gauge and the plane's shadow help you determine your height. The crude, blocky targets grow from small to large, shooting at you as they come, while you swoop in at their height to destroy them. Once you clear the end of the space station (represented by crude bands of blocks), you enter space and move back and forth to destroy the enemy ships.

Although quite playable as a shoot-'em-up, this game suffers from its connection with the original. Arcade fans expect better graphics and a better translation from arcade to home computer.

BERZERK

Company: Atari, Inc.

Language: Assembly

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$31.95

Availability: 10

Disk or Tape: Cartridge

OVERALL RATING	B-	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C+	DOCUMENTATION	B
CREATIVITY	C+	CHALLENGE	B-	HOLDS INTEREST?	B
GAME DEPTH	C+	GRAPHICS	C+	VALUE FOR MONEY	B

Berzerk is Atari's VCS version of the famous arcade game of the same name. The only thing that is sorely missed is the onerous drone of "Quarter detected in pocket, play *Berzerk*."

You begin with three men, and you must fight your way out of a series of mazes inhabited by roving robots. You must shoot these robots while avoiding contact with either the robots or the walls, or face electrocution. Lose all three men and the game is over. You score 50 points per robot and a bonus of 10 per robot per maze if they are all killed. The robots do not mind running into walls or shooting each other occasionally, upping your score in the process. Watch out for "Evil Otto" (a happy face gone bad) when he appears in some of the game options to kill off everything in his path.

There are 12 game options. For example, you can have robots who do not shoot, robots who do shoot, an invincible "Evil Otto," an "Evil Otto" who can be shot, bonus lives for scoring multiples of 1,000 points, bonus lives at 2,000 points, or no bonus lives at all.

The control is very good, but not quite up to what I would like to see in this game. The fault must rest with the joysticks themselves. It is quite difficult to reach the corners of the screen. For instance, when your man appears on the screen and one of the robots is sitting off of his shoulder, he requires a shot between the upper right corner. This is very difficult with the game's present joystick control.

This is, however, a nice, playable game, and could add many hours of enjoyment to your video library.

RAIDERS OF THE LOST ARK

Company: Atari, Inc.

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$31.95

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING	B	CONTROLLABILITY	B+	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	B
CREATIVITY	B	CHALLENGE	A	HOLDS INTEREST?	B
GAME DEPTH	B+	GRAPHICS	B-	VALUE FOR MONEY	B

Raiders of the Lost Ark loosely follows the plot of the movie. It is an adventure game in which the object is to recover the *Lost Ark* from the Well of Souls. You play the hero, Indiana Jones, hired by your government to recover the Ark before your enemies do.

Your journey to the Ark is a long and dangerous one, and you will need to find or purchase various items along the way. Some of the objects you will need are obvious—a whip, key shovel, and magic flute. The marketplace is a good place to start, but there is also a black market for some of the scarcer items. Other objects like the Ankh and Chai are important, but their use is less obvious. You'll eventually need to find the Map Room to locate the correct mesa, but first you'll have to survive the Spider Room and the Room of Shining Light where the Guardian resides.

The game is involved and should take a considerable amount of time to solve. There are many hints in the back of the instruction book for those who become frustrated after playing it for several hours, but even these clues won't offer a complete solution.

The game is played with two joysticks. One stick is used for moving around, shooting bullets, or as Indiana's whip. The other allows you to select an item from among the different objects that you carry. Incidentally, there is a limit of six objects that you can carry, so you will often need to drop something in order to pick up another object.

Raiders of the Lost Ark is a well designed adventure game. It is a very difficult puzzle that takes place on a number of graphically colorful screens. It requires more problem solving abilities than dexterity, although hand-eye coordination is not totally absent from the game. Depending on your ability, *Raiders* should provide many hours of pleasure, or pain.

DRAGONFIRE

Company: Imagic

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING	D	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	D	SKILL INVOLVED	D	DOCUMENTATION	C
CREATIVITY	D+	CHALLENGE	C	HOLOS INTEREST?	F
GAME DEPTH	D	GRAPHICS	D+	VALUE FOR MONEY	D

The goal in *Dragonfire* is to guide a prince across a bridge into a castle to loot a treasure-filled storeroom guarded by a fire-breathing dragon. The hardest part is to get across the bridge while the off-screen dragon hurls fireballs at you. The trick is either to duck or jump just as the fireball approaches. After you master this maneuver, you can enter the castle's treasure room.

The room is guarded by a dragon that paces back and forth at the bottom of the screen. Various colored shapes representing treasure litter the room. You dash around the room and collect the treasures for points while the dragon tries to zap you with fireballs. Once all of the treasure has been collected, you exit the room and reappear back on the bridge. The scenario repeats but at a slightly faster level.

This is all there is to the game. While *Dragonfire* capitalizes on an interesting theme, the game is so simplistic that it is utterly boring. Even the graphics are poor.

ESCAPE FROM THE MINDMASTER

Company: New Venture Communications

Language: Machine

Hardware Requirements: VCS & Supercharger

Department: Entertainment

Sugg. Retail: \$14.95

Availability: 4

Disk or Tape: Cartridge

OVERALL RATING	B+	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B+	SKILL INVOLVED	B	DOCUMENTATION	B
CREATIVITY	A	CHALLENGE	B	HOLOS INTEREST?	B+
GAME DEPTH	A	GRAPHICS	B	VALUE FOR MONEY	B+

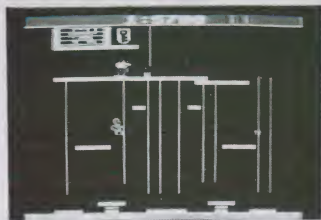
Escape from the Mindmaster is a 3-D, six-level maze game that comes on a multi-load cassette for use with Starpath's *Supercharger*. The object is to escape from the maze, but the Mindmaster (a deranged mad scientist who is evaluating your performance) has other thoughts. Not only do you have to survive the maze's obstacles, but you must pass five of the Mindmaster's tests devised to challenge your intellect and coordination.

You view the maze from a rat's eye view, with the walls looming high around you as you make your moves. The passageways recede in the distance for a good three-dimensional effect. The display at the bottom shows your location on a map, the direction in which you face, and your status. Moving the joystick in the appropriate direction either moves you forward or backward, or turns you left and right.

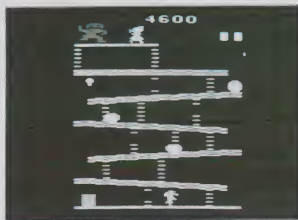
The maze on level one is easy. As you travel around you will encounter pegs of various shapes and colors. These must be picked up and plugged into their corresponding holes somewhere else in the maze. The door that leads to the next level remains locked until all of the pegs are placed in their correct holes. Moving force fields are added on level two, one-way doors on level four, and the Alien Stalker appears on most of the higher levels. This little creep steals one of your points every time he bumps into you. You can't defeat him, but you can avoid him. Fortunately, you can hear him coming by his high pitched beeping sound. Remember that speed is important in this game. A point is subtracted every few seconds from the 60 points with which you start. The remaining points are added to your score when (or if) you escape the maze.

There are five tests that you must pass on each of the first five maze levels. These are: agility, reflex, recall, dexterity, and coordination. Several are simple arcade romps, such as moving side to side to avoid falling bricks. But some are tests of memory, like memorizing a sequence of arrows on the screen and then recreating the pattern with your joystick.

Escape from the Mindmaster is a very good maze game, has considerable depth for a VCS, offers a good challenge, requires both thought and dexterity, and contains fine graphics. Because it is a game that will take some time to master, the writers have been thoughtful enough to allow you to continue the game (if you are killed) from the beginning of the previous section. Thus, if you are killed on level four, you can restart on level three. All things considered, any player who likes a puzzle-type game will enjoy this cassette.



DONKEY KONG, JR.



DONKEY KONG

DONKEY KONG

Company: Coleco

Language: Machine

Hardware Requirements: VCS

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

C-
C+
C
C-

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

C
C-
C+
D+

Department: Entertainment

Sugg. Retail: \$22.00

Availability: 7

Disk or Tape: Cartridge

ERROR HANDLING
DOCUMENTATION
HOLDS INTEREST?
VALUE FOR MONEY

N/A
C+
D+
D+

In the climbing, jumping game *Donkey Kong*, Mario attempts to rescue his girlfriend, held captive by a huge ape at the top of a structure built from ladder-connected ramps. The ape rolls barrels down the ramps, forcing Mario to jump them. With good timing, he reaches the top safely, but Donkey Kong whisks the girl to the second screen, a six-story metal framework guarded by roving fireballs. Mario moves around the framework, kicking out the rivets holding it together. If the fireballs corner him, he has one chance to pulverize them with his hammer. Once he removes all the rivets, the building collapses, and he repeats the sequence at a more difficult level.

This cartridge version may disappoint *Donkey Kong* fans because of its poor to mediocre graphics, and the loss of two screens important in the coin-operated game. Sloppy control means that Mario must jump perfectly to avoid the barrels. It needs improvement.

DONKEY KONG JUNIOR

Company: Coleco

Language: Machine

Hardware Requirements: VCS

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

B+
B
B
B-

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

C-
B+
B+
B

Department: Entertainment

Sugg. Retail: \$30.00

Availability: 7

Disk or Tape: Cartridge

ERROR HANDLING
DOCUMENTATION
HOLDS INTEREST?
VALUE FOR MONEY

N/A
C+
B+
B

In *Donkey Kong Junior*, the sequel to the popular arcade game, the little ape must rescue his papa, held captive by Mario at the top of the screen. Junior climbs the vines flanking the girders, leaps across platforms, clambers down other vines to more platforms, and finally climbs over the far right edge of the top platform. This task requires timing and dexterity, particularly since Mario has sent a legion of Snapjaws down the vines to harass Junior. In the second screen, a Nitpicker bird joins the Snapjaws in trying to catch the young ape while he pushes three keys to the top to release his father. The keys are so heavy that Junior must climb two vines at once. If Junior succeeds, he reaches Mario's lair in the third screen. Now he dashes across coils and climbs more vines to reach Papa while the Snapjaws pursue him.

This version contains realistic graphics, three of the four screens in the coin-operated version, and a theme faithful to the original. Joystick control is rather unresponsive, and jumping from vine to vine requires precise movement. Beginners may find this frustrating. In all, Coleco did a fine job of translating the game with superior VCS graphics.



PITFALL



PORKY'S

PORKY'S

Company: Fox Video

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$19.95

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING

B-

GAME CONCEPT

B-

CREATIVITY

C

GAME DEPTH

B

CONTROLLABILITY

C

SKILL INVOLVED

B

CHALLENGE

B

GRAPHICS

A-

ERROR HANDLING

N/A

DOCUMENTATION

C-

HOLDS INTEREST?

C

VALUE FOR MONEY

B

The game, like the movie, chronicles the attempts of Pee Wee to blow up the famous Porky's Bar. The game has five separate and well-done scenes, but a rather disjointed action. First, Pee Wee must cross seven lanes of a highway at County Line to reach Porky's Bar. This portion resembles *Frogger* and is deliberately difficult. Each time he gets hit he lands in the swamp. To escape the swamp he must pole vault to a platform where he can collect bricks to build an escape ladder. The instructions here are very vague. What you need to do after mastering the pole vault technique is to take a brick from the platform on one side to the platform on the other side. When you touch the wall, the ladder becomes higher. From a total of eight bricks, getting four on one side will allow you to climb out. The difficulty is learning to pole vault: if you miss, you are in the drink minus the brick.

Once out of the swamp, it's on to the movie's famous shower scene. Mazes made up of dashed lines serve as ladders. Pee Wee's task is to climb the ladders to reach a tool atop the shower and push it into the hole at the bottom. Trouble is that if he looks at the naked lady in the shower, Mrs. Balbricker appears, chases him around the maze, and throws him back into the swamp when she catches him. If Pee Wee is successful, he can climb back up to the highway where an additional lane of traffic has been halted.

Sooner or later, Pee Wee reaches Porky's Bar, comprised of a maze of scaffolding. There is only one way up. An arrow on the left indicates whether you are on the right path. A red arrow means you must go back to the bottom and try a different path. Porky, the bar's owner, is on the prowl, and when he catches you, it's back in the swamp. If you make it up the scaffolding you are rewarded with an animated sequence in which a dynamite plunger blows up the bar.

This program has superior animation for a VCS game. The scene with the girl wiggling in the shower and Pee Wee's pole vaulting attempts are both particularly well-animated. But if the graphics are superior, the sound effects are annoying.

The game play, as I mentioned earlier, is a little disjointed. You feel as if you are playing separate games that are only tenuously linked together. There are several levels of difficulty, but even on the easiest levels, if you are inept in navigating the shower ladders, you will be thrown back into that frustrating swamp again and again until you no longer want to play.

PITFALL

Company: Activision

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$31.95

Av. availability: 9

Disk or Tape: Cartridge

OVERALL RATING	A	CONTROLLABILITY	A	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	A	DOCUMENTATION	A
CREATIVITY	B	CHALLENGE	A	HOLOS INTEREST?	A
GAME DEPTH	A	GRAPHICS	A+	VALUE FOR MONEY	A

Pitfall is an imaginative treasure hunting adventure done with arcade style play. *Pitfall Harry's* mission is to travel safely through the jungle collecting the "Lost Treasures of Enarc" within an allotted amount of time. There are dangers in nearly every screen. Some, like scorpions, rolling logs, snakes and alligators, are visible, while others, like quicksand and vanishing pits, appear with time or are tripped when stepped on. Most are deadly. Harry has three lives.

Despite the nearly two hundred different rooms, there are only seven basic scenes. The others are merely combinations. Different dangers or treasures appear within the same scene. The graphics and animation in each scene are excellent with a lot of detail and color.

The game requires considerable skill to master. Harry has to do a lot of running, jumping, and swinging on vines to avoid many of the game's dangers. For example, the use of a swinging vine may be the easiest method to bypass a pool of quicksand or one full of alligators. Without the vine, Harry's timing must be perfect to jump across the backs of three alligators without being eaten. There are numerous rolling barrels in this game so it pays to run from right to left to avoid jumping them. Many of the screens also contain ladders leading to underground tunnels, some of which bypass several surface screens and save you a lot of valuable time. It requires precise timing, however, to jump over the scorpions lurking in these handy tunnels.

Pitfall is an outstanding creation for the VCS game machine. It is very addicting and never becomes boring. The game isn't easy, and novices will have trouble until they become adept at avoiding the obstacles. Since it is an adventure game, *Pitfall* should be mapped, but I'm sure that most kids will just memorize the entire layout after conquering it room by room. *Pitfall* is worth the money.

VENTURE

Company: Coleco

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$22.00

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING	C	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B-	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C-	CHALLENGE	C+	HOLOS INTEREST?	C
GAME DEPTH	C-	GRAPHICS	C-	VALUE FOR MONEY	C

Venture was the first arcade style treasure hunting game to take place in a dungeon filled with monsters. The acarder plays a bowslinging adventurer named Winky who is on a quest to retrieve eight valuable treasures from rooms guarded by monsters. The game is played on two different playfields, each consisting of four rooms. The overview shows the layout of the four rooms, Winky's joystick controlled location, and the numerous Hallmonsters who guard the entrance to the treasure rooms. Upon entering a room the view shifts to an enlarged chamber guarded by four or five deadly monsters. These can be shot with an arrow from your bow. Once all of the monsters have been disposed of, the treasure is free to take (although one of the dead monsters remains deadly to the touch and may block your way). Time is crucial in these treasure chambers. For instance, one of the fast moving Hallmonsters will suddenly crash through the wall and kill you before you can escape, let alone grab a treasure in your panic.

Most of the rooms are very similar in this VCS version, with the exception of the Wall Room which has moving partitions instead of monsters. Although the game becomes faster and harder with each succeeding level, the game quickly becomes repetitious. I think this VCS cartridge, while it plays well, lacks some of the fine detail and variety of the arcade game version.

JUNGLE HUNT

Company: Atari, Inc.

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 9

Disk or Tape: Cartridge

OVERALL RATING	A	CONTROLLABILITY	B+	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	B+	DOCUMENTATION	B
CREATIVITY	A	CHALLENGE	B+	HOLDS INTEREST?	B
GAME DEPTH	B	GRAPHICS	A	VALUE FOR MONEY	B+

Jungle Hunt is an impressive VCS cartridge translation of the arcade game of the same name. Cannibals have captured Lady P. To rescue her Sir Dudley must traverse the Deadly Forest by swinging from vine to vine, swim past or fight fourteen deadly crocodiles, run through a boulder field until he reaches Cannibal Camp, and finally jump past two guards armed with poisoned spears. This game definitely requires dexterity and careful timing.

Traversing the forest by jumping between eleven swinging vines demands careful timing on the difficult level but is easy on the novice level. You must jump when the vines are swinging toward each other. Each of the vines swings at different rates so it is best to wait for them to begin swinging off synch. If you miss you lose one of your five lives, but don't be too cautious. Remember, you have only 500 seconds to reach Lady P before she becomes stew.

Reptile River is filled with deadly crocodiles. Sir Dudley, who is armed only with a knife, can swim underwater to avoid them, but he can hold his breath for only a limited amount of time before he drowns. Swimming on the surface is futile since you can't wield your knife effectively. When swimming underwater a simple blow to the crocodile's head is worth 100 points; but beware any with open mouths, or an erratically swimming rouge crocodile. These lone swimming creatures drop down when you least expect it.

The graphics and animation are exceptionally well done for a VCS cartridge. The authors have managed to give a scrolling feel to both the vine and river sequences. All the characters are animated and colorful throughout. The joystick control is simple and straightforward. You use the button for jumping and controlling your knife. Moving the stick controls Sir Dudley's depth in the river and his position when running through the boulder field and attacking the two cannibals. The game is somewhat simple to play on the easy level and a challenge on the difficult level. In all, it is a very good game that holds interest reasonably well.

SMURF: RESCUE IN GARGAMEL'S CASTLE

Company: Coleco

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$22.00

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING	B-	CONTROLLABILITY	B-	ERROR HANDLING	N/A
GAME CONCEPT	C+	SKILL INVOLVED	B-	DOCUMENTATION	B
CREATIVITY	C	CHALLENGE	B-	HOLDS INTEREST?	C+
GAME DEPTH	C+	GRAPHICS	B-	VALUE FOR MONEY	B-

Smurf: Rescue in Gargamel's Castle features the characters from the popular Saturday morning cartoon show. In this animated adventure Gargamel has captured Smurfette and holds her prisoner on a shelf in his castle laboratory. You play Smurf, a nimble-footed hero who has to journey through mountains, jump streams in open fields, and cross spider infested caverns to reach Gargamel's Castle. The game has six different screens, and is basically a jumping or leaping game on the easiest levels. Mastering it only takes practice. The joystick guides Smurf back and forth. Pushing the stick up causes him to leap straight up. A second quick push makes Smurf leap high over most obstacles like stairs, streams, rock ledges, and onto tables and chairs in the laboratory. Bats, hawks, and snakes are added on harder levels. Smurf can either duck, or very carefully time his leap over the creatures. Because his energy level continually drops, Smurf can't dabble on any screen, and each mistake costs Smurf one of his five lives. He gains points for jumping over obstacles, and may earn an extra life after 10,000 points.

The game is cute, colorful, well-animated, and very suitable for its intended audience of children aged six through twelve. The characters look amazingly like the cartoon characters, and are easily recognized by the children. With only six screens, the game is a bit repetitious. In all, it is a cute game with a very simple rescue theme that young children can identify with. Older children will soon find the game lacks depth.

DRAGON STOPPER

Company: New Venture Communications

Language: Machine

Hardware Requirements: VCS, Supercharger

Department: Entertainment

Sugg. Retail: \$17.95

Availability: 9

Disk or Tape: Cartridge

OVERALL RATING

A-

CONTROLLABILITY

A

ERROR HANDLING

N/A

GAME CONCEPT

B+

SKILL INVOLVED

C

DOCUMENTATION

A

CREATIVITY

B

CHALLENGE

A-

HOLDS INTEREST?

B

GAME DEPTH

A

GRAPHICS

A

VALUE FOR MONEY

B+

Dragon Stopper is a three part adventure game that uses the *Starpath* game adapter. Considerable game depth was achieved by using a multi-load technique for each of the three portions of the game.

The object of the game is to recover a Druidic Amulet possessed by a sinister dragon. To accomplish this nearly impossible task, the *Dragonstopper* must roam the enchanted countryside to obtain the power, wealth, and magic needed to take him across the bridge into the oppressed village. Creatures like the evil monkeys are numerous and particularly troublesome. Keys are necessary to enter the castles, but watch out: some of the entrances are booby-trapped. Crossing the bridge is easiest with a scroll, but bribery is also possible.

The oppressed village in part two is mainly useful for obtaining the supplies and recruits needed to help you defeat the dragon in his cave. You can buy or barter for your provisions in each of the shops: the Magic Shop, Trade Shop, and Hospital. You will have to have picked up enough gold in the countryside in order to purchase the expensive medicine and vitamins sold here. It's difficult to convince recruits to join your expedition, but the right offer may tempt them.

The dragon's cave is riddled with traps, snares, and guardians. Waves of poisoned arrows are very difficult to pass, and a slight scratch from one can bring on a high fever. However, even if you manage to overcome all of the obstacles, the Dragon will likely kill you in his lair. He is large, strong, and nearly impervious to your spells. The Dragon will kill you before you take ten steps toward the amulet.

Game play is a pleasure since all the commands are input by joystick through a series of menus and submenus. For example, one menu will allow four choices: Move, Fight, Use, and Status. Submenus narrow the choices even more, so you don't have to memorize numerous rules or instructions. The game has good graphics, adequate game depth (with virtually no puzzle content), and offers a definite challenge.



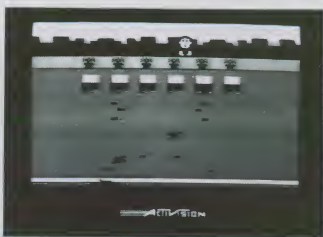
JUNGLE HUNT



SMURF: RESCUE IN
GARGAMEL'S CASTLE



STRAWBERRY SHORTCAKE



CRACKPOTS

CRACKPOTS

Company: Activision

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$31.95

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING	C-	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C-	SKILL INVOLVED	C	DOCUMENTATION	C+
CREATIVITY	C-	CHALLENGE	C+	HOLDS INTEREST?	C-
GAME DEPTH	C-	GRAPHICS	C	VALUE FOR MONEY	C-

The object of *Crackpots* is to protect your house from a gang of nasty termites. You stand guard on top of the house and race back and forth dropping flower pots on them. They are sneaky little bugs and come in a variety of colors and attack patterns. Some advance in a straight line while others zig-zag. When six bugs get past your man, they eat the foundation and it drops a level. Now you have less time to fight them on their next wave.

Of course, *Crackpots* is an unwinnable game. The object is to score as many points as possible. I wouldn't call it much of a game, but this genre has been the bread and butter of the video games for years, even though it requires little or no thought to play.

FROSTBITE

Company: Activision

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$31.95

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING	C+	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C	DOCUMENTATION	C+
CREATIVITY	C	CHALLENGE	C	HOLDS INTEREST?	C
GAME DEPTH	C+	GRAPHICS	C+	VALUE FOR MONEY	C

Frostbite is a game that has some of the same play mechanics as *Frogger*. An eskimo needs to build an igloo before he freezes in the arctic cold. Just offshore are floating rows of ice. Killer clams, Alaskan king crabs, and snow geese lurk in between. If they make contact, they push him off the ice. But as our hero leaps successfully from floe to floe, the ice turns blue and his igloo begins to take shape. Meanwhile, the clock is running out as the temperature falls towards zero degrees.

It is not a very simple game to win. It requires strategy to avoid becoming trapped on one piece of ice and having nowhere to jump. Also, you have to keep jumping up to avoid the hazards, which can only get you when two feet are on the ground. On some levels the blocks get smaller, while on others more hazards appear. On the fourth level you encounter a bear that loiters in front of your completed igloo. You need to be quick to lure him off and scoot in the doorway without getting caught. *Frostbite* is an interesting, non-violent game with typically good graphics by Activision.

STRAWBERRY SHORTCAKE

Company: Parker Brothers

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$30.00

Availability: 6

Disk or Tape: Cartridge

OVERALL RATING	B-	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B-	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	B	CHALLENGE	C	HOLOS INTEREST?	B
GAME DEPTH	C	GRAPHICS	B-	VALUE FOR MONEY	B-

In *Strawberry Shortcake: Musical Matchups*, a charming children's game for four to eight year olds, you must reassemble Strawberry and her friends, whose bodies have been scrambled by the evil Purple Pieman. Luckily, each body has three separate portions (head, body, and legs) and can be put back together fairly easily. In the simplest level, the child chooses only one part with a vertical movement of the joystick, then cycles through the other choices by moving the joystick horizontally. When the child has put together a complete character (Strawberry Shortcake, Blueberry Muffin, Lime Chiffon, Huckleberry Pie, and the Purple Pieman), pressing the button causes the character to dance to its own musical tune. If all the parts fit correctly, all three parts of the tune play; otherwise, a jumbled tune made up of the characters' tunes for the parts chosen plays. If the parts match, the character's name appears followed by a new jumbled character to reassemble.

The game offers a number of skill levels ranging from assembling any character to assembling a specific character, timed games at various speeds, and games with musical clues. The child can refer to the pictures in the instruction manual at any time to see what the characters look like.

I think young children will find this cartridge appealing because of the color, cheerfulness, nonviolence, and catchy musical tunes.

FROGGER

Company: Parker Brothers

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$30.00

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING	A-	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B+	SKILL INVOLVED	B	DOCUMENTATION	C+
CREATIVITY	B	CHALLENGE	B+	HOLOS INTEREST?	A
GAME DEPTH	B+	GRAPHICS	A-	VALUE FOR MONEY	A

The VCS home version of *Frogger* is a nice translation of the original arcade game. Although it lacks some of the fine graphics detail, all play mechanics, action, and special features such as snakes, crocodiles, otter, lady frog, and bonus flies are intact. When the difficulty switch is set in the A position, players face a virtual duplicate of the coin-op game. The *Frogger* music plays in two-part harmony at the beginning of the game.

The object of *Frogger*, for those not familiar with the game, is to guide a frog across four lanes of highway traffic, then across a pond by leaping on the backs of floating logs, crocodiles, and diving turtles, to his home at the far side of the pond. You have to do this five times to complete a level.

The frog can hop in any of four directions by pushing the joystick in the desired direction. A timer ticks as he heads for home. He must complete the trip before it reaches zero. The turtles and logs scroll off the screen if the frog doesn't leap quickly enough. The frog croaks if it goes offscreen on the A difficulty setting, but wraps around unharmed at the B difficulty setting. The easier setting makes picking up bonus flies in the grottos a piece of cake. Bonus points can also be earned if your frog picks up the lady frog that occasionally appears on a log and escorts her home. The diving turtles can be a problem, especially if you are on one when it turns blue. This is the signal that they are going to dive straight to the bottom and take anything on their backs with them.

Each successive round features faster and more numerous vehicles, more crocodiles, and sometimes a snake in the dividing zone. Sometimes a crocodile lurks in one of the five normally empty grottos. *Frogger* is a very playable and easily controlled arcade game. It mainly appeals to children, but adults love this game, too. The designer did an excellent conversion and given the constraints of the VCS, I don't think you will be disappointed.

KEYSTONE KAPERS

Company: Activision

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$31.95

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING

A-

GAME CONCEPT

B+

CREATIVITY

A-

GAME DEPTH

B+

CONTROLLABILITY

B

SKILL INVOLVED

B

CHALLENGE

B

GRAPHICS

A-

ERROR HANDLING

N/A

DOCUMENTATION

B

HOLDS INTEREST?

B+

VALUE FOR MONEY

B+

Keystone Kapers takes you on a merry, animated chase through a department store to apprehend a gang of thieves. You play the part of Keystone Kelly, a seasoned cop who always gets his man. The action takes place on a series of connected screens, each showing the three story layout in addition to the roof. When officer Kelly reaches one end of the screen the action shifts to the next. A security system scanner at the bottom of the screen shows the location of the officer and the crook in the store. The floors, finally, are connected by an elevator in the center and "up" escalators at either end.

You have to be fast to catch these crooks: they don't exactly play fair. They throw everything at you from beachballs and shopping carts to toy bi-planes and cathedral radios. You have to either jump over them or duck. I think ducking is more prudent, especially since one of those bi-planes can kill one of your three cops. They leave behind stolen suitcases and bags of money in their escape, and these can be picked up for extra points. The crooks eventually run for the roof; get there ahead of them and there is no way down. You must apprehend each crook before he escapes from the roof or the clock runs out.

The game is well designed, very colorful, expertly animated, and becomes more difficult as more crooks are caught. You need to develop a rhythm to avoid colliding with the objects tossed at you so as not to lose valuable time off the clock. *Keystone Kapers* is a fun game particularly for the children, and will hold your interest for some time.

DOLPHIN

Company: Activision

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$31.95

Availability: 6

Disk or Tape: Cartridge

OVERALL RATING

B-

GAME CONCEPT

B

CREATIVITY

C+

GAME DEPTH

C

CONTROLLABILITY

B

SKILL INVOLVED

B

CHALLENGE

B

GRAPHICS

B+

ERROR HANDLING

N/A

DOCUMENTATION

B+

HOLDS INTEREST?

C

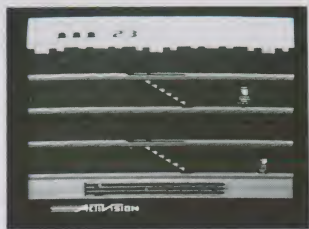
VALUE FOR MONEY

B-

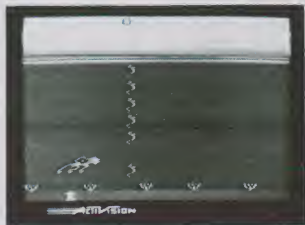
Dolphin is one of the first games to effectively use sound, in the guise of sonar, as an integral part of the game. Your dolphin and a trio of reserve creatures must elude a giant squid who is attempting to catch dinner. The only two escape routes, East and West, cause the playfield to scroll. The object is to escape the pursuing squid long enough to catch a seagull which gives you the magic power to turn hunter rather than prey. Kill the squid and you advance to the next difficulty level. However, just staying ahead of the squid is difficult enough.

A number of sea horse barriers with narrow gaps slow you or the squid down if you strike them. However, there are narrow gaps through which you may pass. The tonal pitch emanating from the dolphin's sonar alerts him to the location of the gaps. A high pitch means the gap is near the top, while a low tone means the gap is near the bottom. In addition, there are arrow-like waves to help or hinder the dolphin's swimming. If the dolphin catches the wave in the right direction he can out-distance the squid; and if he can lure the squid onto a wave he can slip beneath him and travel in the opposite direction before the squid can pursue.

While not overly difficult, *Dolphin* still offers a challenge. It takes some practice to master the techniques of outwitting the squid, so the game might become frustrating to very young players. The graphics are colorful, and animated with good representations of the squid and dolphin. Smooth scrolling and overhead cloud movement heighten the effects. *Dolphin* offers good solid game play and should hold a player's interest for a long time.



KEYSTONE KAPERS



DOLPHIN

DECATHLON

Company: Activision

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$34.95

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING
GAME CONCEPT
CREATIVITY
GAME DEPTH

C-
B
C
B

CONTROLLABILITY
SKILL INVOLVED
CHALLENGE
GRAPHICS

C
D
C
C-

ERROR HANDLING
DOCUMENTATION
HOLDS INTEREST?
VALUE FOR MONEY

N/A
C
D+
C-

Decathlon is a VCS cartridge that lets one to four players compete in the centerpiece Olympic event, the decathlon. The fact that David Crane managed to squeeze all ten events plus the Olympic anthem into one cartridge is remarkable. On the other hand, the competition requiring repetitive joystick motion to move the runner, thrower, or jumper in nearly all ten events becomes boring way before the contest is half over. Yet in some ways, the fatigue that occurs mirrors the agony of the actual competition.

One to four players compete in ten separate events: the 100 meter dash, long jump, shot put, high jump, 400 meter dash, 110 meter hurdles, discus throw, javelin throw, and the 1500 meter run. Since performance depends on speed of joystick movement, it is best to find the softest joystick for this test of endurance. I chose a Kraft for its quickness and ease of movement. Since only one joystick is used, each competitor has an even chance. The players take turns, each running the first event against the clock. Each player moves an animated running man on a scrolling track. Although toggling the joystick is not too demanding on the 100 meter dash, it takes nearly a minute in the 400 meter dash, and over four minutes in the 1500 meter run. It becomes sheer agony as your hand cramps and you begin to sweat.

The other events have a little more animation, especially in the pole vault and high jump. Again, the starting run is made by moving the joystick rapidly back and forth, but timing is required to plant the pole and vault over the bar by pressing the button. The same is true in the high jump. The player gets three attempts to clear the bar at a set height before the bar is raised even higher. The javelin event is merely a run and throw event, while the little man just spins rapidly before releasing in the shot put event.

Perhaps I am being too critical of a VCS cartridge, but the different events are much too repetitive. Yes, there is a sense of competitiveness to the game, but this is largely an individual thing involving statistics and points. This can be accomplished best in the practice mode. But the feeling of competition that the decathlon is supposed to engender is sorely lacking in this cartridge.

NO ESCAPE

Company: Imagic

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 6

Disk or Tape: Cartridge

OVERALL RATING

C+

GAME CONCEPT

B

CREATIVITY

C

GAME DEPTH

C+

CONTROLLABILITY

C+

SKILL INVOLVED

B-

CHALLENGE

B

GRAPHICS

C

ERROR HANDLING

N/A

DOCUMENTATION

C

HOLOS INTEREST?

C+

VALUE FOR MONEY

C+

No Escape combines elements of a shoot-'em-up game and *Breakout*. Jason is trapped in a temple with a column of six dangerous furies hovering overhead. The temple roof consists of colored bricks, much like those in *Breakout*. You fling rocks at the falling bricks in an attempt to knock them into a position to kill the furies without harming Jason. You must be careful, because if you accidentally hit a fury with a rock, it will clone itself to replace one of its dead sisters.

While the game is simple, it takes some effort to figure out the patterns of movement of the furies and the falling bricks. As the game progresses, the patterns change and the furies become quite adept at dodging the bricks. On upper levels, they can even shoot back. The best technique is to sling several rocks at once so that they can't avoid all of the falling bricks. As the column gets further from the temple roof, you may find it difficult to kill the last fury.

The game's four skill levels let you start further into the game if you wish. *No Escape* offers challenge, but I doubt it would hold your interest for long unless you get caught up in the play dynamics or try to rack up a new high score.

ADVENTURES OF TRON

Company: Mattel M-Network

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 4

Disk or Tape: Cartridge

OVERALL RATING

D+

GAME CONCEPT

C

CREATIVITY

C-

GAME DEPTH

D+

CONTROLLABILITY

C

SKILL INVOLVED

C-

CHALLENGE

C

GRAPHICS

C+

ERROR HANDLING

N/A

DOCUMENTATION

C-

HOLOS INTEREST?

D+

VALUE FOR MONEY

D+

Adventures of Tron is a single-screen game where the object is to collect all seven floating bits near the I/O beam. The grid consists of four floors connected by elevators and patrolled by Grid Bugs, Tanks, and Recognizers. These MCP attackers first appear on the top floor and snake their way to the bottom. The bright yellow I/O beam divides the center. Our hero, Tron, must constantly run and jump down floors to avoid his enemies. If he breaks the beam and moves immediately to the elevators on either side, it will take him up one level. Most of the necessary bits are on the top two levels. During the cat and mouse game of avoiding all those moving attackers, Tron usually has to jump downward to escape. He can avoid some by catching a Solar Sailer that floats high overhead. It will carry him over the advancing Recognizers to the other side of the floor.

Since the game lacks any depth, it is very repetitive. Once you collect all seven bits, you just begin again on the same screen at a slightly faster pace. The graphics are nicely detailed so that all objects from the movie are recognizable, and Tron's body is animated when he runs and jumps.

TUTANKHAM

Company: Parker Brothers

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 7

Disk or Tape: Cartridge

OVERALL RATING

B-

GAME CONCEPT

B

CREATIVITY

C

GAME DEPTH

B-

CONTROLLABILITY

C+

SKILL INVOLVED

B-

CHALLENGE

B+

GRAPHICS

C-

ERROR HANDLING

N/A

DOCUMENTATION

B-

HOLOS INTEREST?

B-

VALUE FOR MONEY

B-

As an explorer in the Boy King's tomb, you have to find and recover treasure located in each of the four different chambers. Your ultimate goal is *Tutankham*'s death mask located behind the last door in the final chamber. To get

there, you need to explore each of the chambers within a time limit while under attack by cobra snakes, desert scorpions, vicious turtles, and spirits of the gods.

The archeologist is joystick controlled. As he moves through the passageways, each maze begins to scroll. Some of the passageways appear to be dead ends, but secret corridors link them to others. The object is to find a key allowing you through the door connecting the different chambers. Creature nests are scattered throughout the maze. You can kill the creatures with your laser gun, but it only shoots horizontally. This limitation dictates your strategy. There are three laser flashes for dire emergencies. They will annihilate all creatures on your portion of the maze floor.

The graphics in the coin-op version of this game did much to enhance its popularity. Unfortunately, in the cartridge, much of the detail was replaced by colored bands and barely recognizable characters. To make up for it, they increased the playability and action by adding countless numbers of monsters that appear at will.

COSMIC ARK

Company: Imagic

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 5

Disk or Tape: Cartridge

OVERALL RATING	D+	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	D	CHALLENGE	C+	HOLDS INTEREST?	D+
GAME DEPTH	D+	GRAPHICS	C-	VALUE FOR MONEY	D

Cosmic Ark is a mindless game of quick reflexes. It consists of two parts. First your spaceship (or ark) is bombarded by a meteor shower. To protect the ship, you shoot down meteors with guns on the four sides of your ship. This mimics an old arcade game called *Phaser Zap*, which at least required concentration to survive.

After surviving the bombardment, you proceed with your main mission, which is picking up animals (in pairs) from the various planets in the universe. You accomplish this by launching a small shuttle craft from the mothership and capturing the beasts with your tractor beam. You must hold the beam long enough or the creatures will escape. If you linger too long, the planetary defense system will zero in and destroy your shuttle. And, if the alarm sounds, you must quickly return to defend the mothership from another meteor shower.

There isn't much to this game and it gets old quickly. The graphics are plain. Each beastie looks the same and so do all the different planets. It also lacks cohesion.

SKY JINKS

Company: Activision

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$22.95

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING	D+	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C-	DOCUMENTATION	B-
CREATIVITY	D	CHALLENGE	C+	HOLDS INTEREST?	D+
GAME DEPTH	D	GRAPHICS	C	VALUE FOR MONEY	D

Although an aerial game, *Sky Jinks* has much of the play action of many ski slalom games. The object is to pilot your P-41 aircraft through a course of between 25 and 99 pylons, depending upon which of the five games you choose to play. Trees and aerial balloons act as obstacles on this course.

Your joystick-controlled plane banks on the turns as you maneuver through the pylons. You must fly to the right of the red pylons and to the left of the blue pylons. The joystick button acts as a throttle to increase speed. You need the shortest time, but missing a pylon penalizes you three seconds. The advanced difficulty setting pits the obstacles directly in your path so that you must constantly dodge them. If you hit one the plane crashes, ending the game.

This cartridge is a very weak entry in Activision's new releases. While graphically colorful, it is very repetitive and has little play depth. *Sky Jinks* does offer a challenge, but once you master the finer points of flying, the game becomes tedious.

BLUEPRINT

Company: CBS Electronics

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$25.00

Availability: 6

Disc or Tape: Cartridge

OVERALL RATING

C-

CONTROLLABILITY

B

ERROR HANDLING

N/A

GAME CONCEPT

C

SKILL INVOLVED

C-

DOCUMENTATION

C

CREATIVITY

C-

CHALLENGE

C-

HOLDS INTEREST?

C-

GAME DEPTH

C-

GRAPHICS

C

VALUE FOR MONEY

C

Blueprint is a cleverly conceived memory challenge game. The object is to race against time to find the pieces of a cannon that have been scattered in a maze-like neighborhood. Since you actually see the pieces as they rapidly move to the different houses, those with total recall will win this game quickly.

The trick is that the joystick-controlled hero must find the pieces and reassemble them in the correct order, bottom piece first. The easiest game has only four scattered pieces, but as many as eight are hidden in advanced levels. The maze consists of ten houses; some contain pieces, others contain bombs. The corridors are patrolled by a character called Fuzzy Wuzzy. If you find a wrong piece, you have to put it back in the right house. If you find a bomb, you have to rush to the bomb bit at the lower right side of the screen and defuse it before it explodes. Once you complete your cannon, you activate it by touching the start button on the lower left. The screen switches and you must now save Daisy, who is being pursued by Ollie Ogre. Kids who like memory test games will enjoy *Blueprint*.

OINK

Company: Activision

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$31.95

Availability: 8

Disc or Tape: Cartridge

OVERALL RATING

D+

CONTROLLABILITY

C+

ERROR HANDLING

N/A

GAME CONCEPT

D+

SKILL INVOLVED

C-

DOCUMENTATION

C

CREATIVITY

C-

CHALLENGE

C+

HOLDS INTEREST?

C

GAME DEPTH

D

GRAPHICS

D

VALUE FOR MONEY

D

Oink is one of those mindless arcade games that becomes a test of endurance. You play the part of a pig whose house is under attack by the big bad wolf. This wolf has lungs of steel and is blowing away the bricks one by one from his determined stance at the bottom of the screen. Your job is to use your joystick to pluck the row of bricks one at a time from the ceiling and toss them down toward the gaps in the floor. Each time you deplete a row of bricks, a new one forms. Meanwhile, the wolf acts like a giant vacuum cleaner and tries to suck you through the gap in the floor. Fortunately, if you prevent him from forming too large a hole, you can save your ham.

This is one of those games that you could play forever if you could just keep slightly ahead of the wolf. It is a tedious game with little depth, and your hands become painfully tired. The game has a polished look with lots of color and good detail. It is obviously a children's game, but I think even they will quickly become bored.



ENDURO



BLUEPRINT

SPIDERMAN

Company: Parker Brothers

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$29.95

Availability: 6

Disk or Tape: Cartridge

OVERALL RATING	C+	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C+	SKILL INVOLVED	C+	DOCUMENTATION	B-
CREATIVITY	C	CHALLENGE	C+	HOLOS INTEREST?	B-
GAME DEPTH	C	GRAPHICS	C-	VALUE FOR MONEY	B-

In this arcade climbing game, Spiderman must disarm the Super Bomb left on top of a tall building by his arch enemy, the Green Goblin. His method of scaling the building is particularly intriguing. Spiderman carries a bottle of fluid which he uses to make a web line. He stops and you aim the line with the joystick, press the button to shoot it, and hold the button down until the strand reaches the desired length. He attaches it only to the yellow parts of the building. If he attaches the line to a blue part representing a window or open scaffolding, Spiderman will fall off. Even as he falls, he can attach a new line and stop his descent.

A number of criminals randomly appear in the windows to prevent Spiderman from reaching the bomb. They will cut his web line if it crosses a window, but he can capture them by moving over them. Each capture wins him more fluid, as does disarming the bombs on the high voltage tower. Since the Green Goblin doesn't want Spiderman to catch too many criminals or defuse too many bombs, he sets secret limits. If Spiderman passes them, he activates the Super Bomb. He also blocks your hero's path and will cut the line if possible. Spiderman has only a few seconds to defuse the Super Bomb once it begins to buzz.

Although simple, *Spiderman* is fun to play. It got mixed reactions from the people playing it. Some found it boring, but others liked to have Spiderman fall off the building and stop his fall with the web line. I liked the game despite its limited depth.

ENDURO

Company: Activision

Language: Machine

Hardware Requirements: VCS

Department: Entertainment

Sugg. Retail: \$31.95

Availability: 8

Disk or Tape: Cartridge

OVERALL RATING	C+	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C-	DOCUMENTATION	C+
CREATIVITY	C	CHALLENGE	C	HOLOS INTEREST?	C-
GAME DEPTH	C	GRAPHICS	B-	VALUE FOR MONEY	C

Enduro reminds me of an early racing game called *Night Driver*. The road curved and zig-zagged as your car moved down the course. Activision has updated the graphics, added several hundred cars that act as obstacles during the race, and varied the driving conditions to relieve the tedium.

The object is to drive the furthest during the race. A daily goal is set for the number of cars you must pass. You lose if you don't pass 200 cars during a 24-hour period. Quotas on subsequent days are even harder. As you press the joystick button to go faster, the cars that you approach from the rear have to be avoided. If you hit a car, your car stops and nearby cars pass you. As the day goes on, the weather worsens, making it more difficult to control your car. When night comes, it is hard to see much beyond your headlights. It is best to drive slower now and more carefully.

The game is graphically well done. The road swerves back and forth and the horizon scrolls realistically as you turn. Game play leaves a lot to be desired. There is very little feel to driving the car. Except when you are on snow, the car steers normally and turns easily. The only thing you have to do is avoid collisions and endure. It isn't a bad VCS racing cartridge, but it is a bit on the boring side.

ATARI HARDWARE

GAME I/O PORT PERIPHERALS

JOYSTICK — ATARI — \$9.95. Millions of these joysticks have been sold for use on both the Atari VCS and home computers. It is a joystick with a very simple mechanism. Tilting the stick pushes the nylon base against a piece of dimpled metal switch on the circuit board. When it is released and centered by spring action, the metal pops up, and the switch opens again. There are four of these contacts plus the one at the base of the fire button. The stick is certainly not arcade quality, and tends to wear out more often than any of the more expensive sticks. It's popular chiefly because of its very accurate response. Since it takes some force to activate, players are more sure of their movement and know when the stick has returned to neutral center. However, this excessive force tends to produce muscle fatigue, and many an *Asteroid* player's hand begins to cramp during a long game. The button is at the top left of the base and clearly favors right-handed players.

VIDEO COMMAND - ZIRCON - \$14.95. This joystick first appeared on the old Fairchild Channel F game unit. In many ways it is a good replacement for the Atari joysticks. They are slim and can be held in either hand. The joystick mechanism, which protrudes from the case at the top, moves easily in any direction while simultaneously acting as a firing button when pushed. Its low-spring tension is a relief when playing certain types of games that don't need accurate centering. It is great for games like *Star Raiders*, but performs very poorly in games that require precise positioning (e.g., *Missile Command*). It also isn't very good in games like *Frogger* or *Pac-Man*, where you must be sure you have returned to the neutral position before moving again.

STARPLEX CONTROLLER — STARPLEX ELECTRONICS — \$29.95. This unit has the same button configuration as the *Asteroids* arcade game. The left and right buttons are on the left side of the panel, the up (thrust) and fire button on the left, and the down (shields) below center. The buttons are extremely responsive, if not a little light on the touch. The unit doesn't take long to get used to, and is also suitable for playing *Galaxian* and *Space Invaders*-type games. The unit also has a "rapid fire" option. There is a small diode circuit requiring batteries; this allows the player to shoot continuously when depressing the fire button. This helps with fatigue problems associated with constantly pressing a fire button in shoot-'em-up games. The unit doesn't look very rugged, but has nicely withstood the neighborhood gang.

PADDLES — ATARI — \$14.95. These are the only paddles available for the Atari. They are potentiometer-type units that return a value over a linear range. They are quite suitable for any program that requires precise screen positioning. They can be used in a custom drawing program where each paddle represents the position on an axis. Or they can be used for games like *Super Breakout*, *Avalanche*, or *Clowns and Balloons*, which require smooth and accurate horizontal positioning.

LE STICK — DATASOFT — \$39.95. This is a rather novel joystick in that there are no moving parts. It has been designed to be held in one hand and simply tilted in the direction of desired movement. It has a set of mercury switches inside that close when the unit is tilted 20 degrees off axis. It has the usual joystick button at the very top and is fired with thumb action. This joystick takes getting used to. It works very well playing *Star Raiders*, but much less so playing *Pac-Man*. There is a second switch in the handle that will turn the unit off only while squeezing it. It does take the tension of holding the unit exactly upright while hyperwarping on the novice level in *Star Raiders*, but has little other apparent use. While LE STICK offers the freedom to play games with one hand, it isn't a joystick that everyone will like, nor one that works with all games.

PROSTICK — GAMES, INC — \$34.95. This joystick was built for durability. It uses four leaf-type switches rather than bubble contact switches. Each can be replaced separately, if necessary. The cable is strain-relieved. The joystick doesn't have much spring tension, yet has no trouble returning to neutral center. The fire button has a longer throw than most, and can't be rapid fired as fast. Game playability is good with this unit, much less fatiguing than with the Atari joystick. PROSTICK is rectangular and fits comfortably in one hand. The button placement clearly favors right-handed players.

COMMAND CONTROL TRACKBALL — WICO — \$69.95. This rugged unit is made by the same people who make trackball controllers for a large number of arcade machines. It is a solid piece of hardware that has a very smooth feel, and is capable of fast accurate positioning in games like *Centipede* and *Missile Command*. It is a large unit with felt non-skid pads on the base, and is meant to rest on a table. It also can be held resting on one knee. It has a very short throw fire button which is capable of "rapid fire" shooting. The unit does not behave as a real trackball in that it puts out pulsed joystick signals, and therefore does not position as rapidly as arcade trackballs. However, it works with any game that uses standard joystick input. It will not work in the (undocumented) *Missile Command* trackball mode. In my opinion, this unit makes games like *Centipede* finally controllable. Game scores are triple or more than those earned using a normal joystick. While the unit is good for certain types of games, it does not replace the joystick for others.

COMMANDER DELUXE — COMREX — \$44.95. This rather large, awkward unit shaped like a telephone was designed for a variety of computers, from Apple II to Atari VCS, Atari 400/800, Commodore 64, and Coleco Vision. It features a self-centering analog gimbaled stick and two snap action buttons on each side. The side button works on Atari systems. Trim pots on the base require precise alignment to function properly. The stick is totally unresponsive to control in games, reacting to new commands only when it has reached its furthest point. While this stick might be useful on other computer systems, it is the worst joystick available for Atari.

COMMANDER — COMREX — \$19.95. The Commander features a flat, easily grasped case with two fire buttons for both left and right-handed game play. Although noisy because of a set of snap action microswitch contacts, the stick is highly responsive to a light touch.

KRAFT JOYSTICK — KRAFT SYSTEMS — \$19.95. This small, lightweight unit with its thin handle is highly responsive and accurate in games, even those requiring speedy yet deft control. It causes no hand or finger fatigue, and is the best hand held joystick on the market.

PROSTICK II — NEWPORT CONTROLS — \$24.95. These blue controllers, supposedly molded for comfortable hand use, don't fit properly unless your trigger finger wraps around the front of the stick. Two fire buttons allow use by left or right-handed players. A gateplate set around the base lets you move in eight or in four directions (useful in maze games). The stick feels rigid and responds poorly in games requiring a light touch, becoming uncomfortable to hold over long periods. Like its predecessor, it is durable and unlikely to break even with punishment.

JOY-SENSOR — SUNCOM — \$34.95. In this unusual unit, a touch-sensitive disk substitutes for a joystick. A switch disables diagonal movements, and a touch-sensitive fire and rapid fire panel occupy the top of the flat control panel. The panel also includes both left and right fire markings, making it possible for two left-handed people to play. The lack of moving parts should make it durable, and I was pleased at how well it worked. The sensor takes getting used to, however, being overly responsive for many games. Definitely try this disk before you buy it.

ENJOYSTICK — TG PRODUCTS — \$29.95. This lightweight, hexagonal joystick has a gimbaled mechanism. You can switch the fire button to accommodate left-handed players by squeezing the plate containing the button, lifting it out, and rotating it to latch the button on the right side. I found the unit comfortable to hold, but somewhat unresponsive because of the excessive movement required to make contact.

TAC-2 — SUNCOM — \$19.95. Suncom has enlarged the base of the Tac-2 and increased the size of the protective cone around the mechanism to increase the unit's durability. The stick features a large diameter ball grip and two fire buttons. It has an extremely short throw, but lacks responsiveness, so I'd rate it average.

TRIGA COMMAND — ELECTRA CONCEPTS — \$15.95. This massive joystick looks like it came off a coin-op game. The designers built the trigger into the pistol grip handle, and included rubber grip pads to keep the stick steady on a level surface. Although noisy and requiring a hard push in any direction, it responds to a surprisingly light touch and feels comfortable held in your hand.

CONTROL CONSOLE — QUESTAR — \$44.95. This monstrous unit, designed to act and feel like the controls of a coin-op game, suits either left or right-handed players because of the fire buttons set on each side. It works best when held in your lap, and responds well in all types of games.

POINTMASTER — DISCWASHER — \$16.95. This not very rugged unit uses bubble contact switches on the circuit board, as does Atari. The long pistol grip handle, with the fire button on top, requires extended movement before the controlled object reacts, giving you the impression that the stick will break off. Despite its loose feel, most people will double or triple their scores over those gained with their old Atari sticks. The neighborhood children liked using it, and it has held up for the last year.

POWER GRIP JOYSTICK — WICO — \$29.95. The large, contoured grip on this joystick probably makes it the most comfortable to hold. The grip also rotates for better control. The stick gives you the choice of firing from the top (with your thumb) or from the base (with the thumb of your other hand). A switch on the base makes one or the other operational. This ruggedly built unit uses the same components used in the arcades, but will not slip when placed on a table because of rubber pads on the base. Leaf-type switches afford durability. Although slightly mushy in response, it works well for most games and most of the youngsters who tested it liked using it.

THREE-WAY JOYSTICK DELUXE — WICO — \$32.95. This joystick, otherwise identical in construction and operation to the Power Grip model, has three interchangeable handles: a bat handle, a trigger shaped handle with ridges, and a trigger shaped handle without ridges. A strong yank upwards separates the handle from its O-ring.

THE BOSS — WICO — \$19.95. This smaller, lighter, less expensive version of the Power Grip stick features only one fire button, on top of the handle. The smaller size better suits children. The handle, contoured with finger positions, twists for better control. Although slightly soft in response, it performs well in most games. It should hold up well to abuse because it consists of the same rugged components as Wico's more expensive models.

ANALOG JOYSTICK — WICO — \$49.95. This 360 degree potentiometer-type joystick can replace your ailing 5200 sticks. Although it doesn't replace the keypad portion, it comes with an adapter plug so that you can plug it in with your old joystick. Two externally mounted trim pots center the unit for a particular game, but you can disable the self-centering mechanism from the controls underneath. Two leaf switch fire buttons ensure durability.

COMMAND CONTROL JOYSTICK — WICO — \$29.95. This oversized joystick is made from quality components. Leaf-type switches are used throughout for long lasting durability. The unit has two separate switch-selectable fire buttons. The first is on the base in the usual spot, while the second is on the top of the stick. The stick is long enough to allow one to grip it with the palm and fingers. The trigger can be fired with the thumb. The spring centering is rather soft. While this is less fatiguing, it does not reliably return the stick to neutral center and may cause problems in games like *Frogger*, where moves are only made after returning to center. Most other types of games play very well with this joystick.



- A — COMMAND CONTROL TRACKBALL — WICO
- B — POINT MASTER — DISCWASHER
- C — VIDEO COMMAND — ZIRCON
- D — PROSTICK — GAMES, INC.
- E — LE STICK — DATASOFT
- F — JOYSTICK — ATARI
- G — VIDEO GAME CONTROLLER — STARPLEX
- H — COMMAND CONTROL JOYSTICK — WICO
- I — PADDES — ATARI



- J — ANALOG JOYSTICK — WICO
- K — CONTROL CONSOLE — QUESTAR
- L — TRIGA COMMAND — ELECTRA CONCEPTS
- M — POWER GRIP JOYSTICK — WICO
- N — JOY — SENSOR — SUNCOM
- O — ENJOYSTICK — TG PRODUCTS
- P — THE BOSS — WICO
- Q — KRAFT JOYSTICK — KRAFT
- R — TAC-2 — SUNCOM
- S — PROSTICK II — NEWPORT CONTROLS

PRINTERS FOR YOUR ATARI

After you have purchased your Atari, filled it up to 48K of memory, added your first and probably your second disk drive, the next logical step is to add a printer.

Since the Atari can be "hooked up" to many printers, the potential purchaser is presented with a wide variety from which to choose. In view of that, *The Book* has chosen some of the more popular printers, presenting below a brief chart of their various characteristics to assist you in your deliberations.

We hasten to point out that this is a small sample of the number of printers available. However, in terms of price/performance, they are among the best.

The chart only refers to dot matrix printers: i.e., the characters are formed by a series of dots. Normally, the higher the matrix, the better the appearance.

CPS = Characters per second

CPI = Characters per inch

Type of Paper Feed = T(Tractor), F(Friction), P(Pin Feed)

DOT MATRIX PRINTERS

SPECIFICATIONS	IDS 460G PAPER TIGER	EPSON MX-80/ MX-80FT	EPSON MX-100	ANADEx DP 9620A	NEC 8023A-C	CENTRONICS 737 ATARI 825
SPEED (CPS)	160	80	100	80/132	100	80/50
BI-DIRECTIONAL	YES	YES	YES	YES	YES	NO
MATRIX TYPE	9x9	9x9	9x9	9x9	9x9	7x8
GRAPHICS	YES	YES	YES	YES	YES	NO
ADJUST LPI	6,8	6	6	6,8	6	6
5 CPI (Enhanced)	YES	YES	YES	YES	YES	NO
10 CPI (Standard)	YES	YES	YES	YES	YES	YES
16.5 CPI (Condensed)	YES	YES	YES	YES	YES	YES
PROPORTIONAL SPACING	NO	NO	NO	NO	YES	YES
LOWER CASE DESCENDERS?	YES	YES	YES	YES	YES	YES
FEED	T	T/F,T	F,T	T	F,T	F,P
(1-10) SERVICABILITY	5	8	8	8	7	6
(1-10) PRICE PER- FORMANCE RATIO	8	10	10	8	9	6
APPROX. RETAIL PRICE	\$1295	\$645/\$745	\$995	\$1100	\$795	\$995

WHOLE CHARACTER PRINTERS

	NEC Spin- writer 3500/7700	Diablo 630	QUME Sprint 7	Brother HR-1	Smith Corona TP-1	C.I.TOH Starwriter F-10
SPEED (CPS)	35/55	32-40	45/55	16-20	12	40/55
PAPER WIDTH	16"	16"	13"	16.5"	13"	16"
GRAPHICS	NO	YES	YES	YES	NO	YES
COST	\$1995/ \$2535	\$2400	\$2490/ \$2625	\$1100	\$895	\$2000

A whole character printer is one whose characters are formed much like a typewriter. The characters are usually on a revolving daisy wheel, spun at high speed, and struck with a hammer in their appropriate places on the page. The paper for each of the line printers is tractor (pins) and friction feed, except for the *Brother* and *Smith Corona* units, which are friction feed only. The resulting text has a printed look, or typewriter quality finish.

MXPLUS

Dresselhaus Computer Products

\$49.95

MXPLUS is a small circuit board that plugs into your Epson Printer. It allows you to set the print mode directly on the printer using the three select buttons, rather than with complex Control codes in your program. In addition, it has automatic perforation skipover, a feature that the original Epson printer and Grafrax chip didn't have.

You install the chip "piggyback" over the ROM 1B socket. The *MXPLUS* board plugs into the chip's empty socket, and that chip plugs into the *MXPLUS* board. Two leads from the board are clipped to pins on the 1B and 1C chips. The exact locations are illustrated in the instructions, and the entire procedure takes less than ten minutes. The greatest portion of that time is spent taking off the printer's cover.

Eight print modes can be selected individually or in combination. They include condensed, double width, emphasized, double strike, italics (Grafrax only), 8 lines/inch, indent, and perforation skip-over. First activate the MPC by holding down the "on-line" button until it beeps. Each function is assigned a number of beeps. For example, emphasized print requires four beeps; that's three additional beeps added to the first. At that point, the function can be turned on or off with the FF button. The "on-line" lamp blinks a pattern that indicates whether a function is on or off. A long "on" with a short "off" indicates the function is turned on, while the reverse is true if the function is off. You exit the MPC mode by pressing the LF button. The "on-line" button is tapped again to put the printer back on-line.

This little accessory comes in handy when you are using various commercial packages. For instance, you may be using *Visicalc* and find that you forgot to put your printer into the 132 column (condensed) mode in order to print the entire spreadsheet. You can make the change without affecting the software. It is also very convenient when using various word processors and you want to select emphasized/double-strike for a high quality final draft. And you can use the indent feature for program listings, so that you will have room in the left margin for the three hole punch.

In sum, it is an excellent and useful product, compatible with all Epson MX-80/100 printers, with or without Grafrax/Grafrax + chips. While the Grafrax + chip now includes skip-over perforations, the *MXPLUS* offers the convenience of setting print modes without learning complicated Control codes.

Omnimon!
CDY. Consulting
\$100.00

As many Machine language programmers will testify, a built-in Machine language monitor is sadly lacking in the Atari computer. The *Omnimon!* was designed to correct this deficiency. It is a hardware device that piggybacks the O.S. board and uses the empty 4K memory bank located at \$C000. By adding a 4K ROM-resident monitor, the Atari Computer gains a Machine language monitor similar to the standard equipment available on other micros like the Apple II. Best of all, since it is in ROM and always available in memory, it doesn't have to be loaded.

Since *Omnimon!* is virtually unaffected by whatever program is currently running within the computer, the program can be interrupted and the memory examined or modified. The program will continue from where it left off just by holding down the START button and hitting RETURN. ROM jumps to the point at which the program counter is set, so by modifying this address, you can test subroutines within a program. The utility is most useful in debugging your own programs, but it's also useful for examining work done by others.

Omnimon! is entered by pressing SYSTEM RESET while holding down either the OPTION or SELECT keys. It can also be activated by a JSR \$C001 from Assembly language or with a USR call out of BASIC. Once activated, you can examine and modify registers or memory, search or disassemble memory, or play with the stack. In addition, the ROM can dump displays to the printer and read and write individual disk sectors without DOS. This could be useful in an emergency such as having to recover a text file when your word processor crashes. The sectors are written as raw data so that you will have to use a disk utility such as the company's *Diskscan* to convert it to DOS files. *Omnimon!* will read either 128 byte/sector boot format or 128 byte/sector DOS format.

The command format is simple and modeled after those in the Editor Assembler cartridge with the command letter appearing first. For example, D 2000 2100 will display memory from \$2000 to \$2100. Syntax is always checked and defaults to standard parameters are specified. All of the Atari's screen editing functions are supported.

The board is easy to install. You pop off the top and pull out the O.S. board in Slot #1. Take the cover off, and while you are at it, remove the cover on the adjacent memory board (which is only likely to get in your way later). Pull out one of the O.S. ROM chips and plug the L-shaped *Omnimon!* board in its place. The displaced chip is plugged into the empty socket on the board. You also need to insert a one-wire patch to a pin on an adjacent chip on your O.S. board. Don't solder it—wedge it in the socket if you pull the chip out first.

I have found the board useful although I usually use the Machine language monitor in my *Syn-Assembler* cartridge. My main concern was whether *Omnimon!* would be compatible with the vast number of commercial software on the market. In fact, I have had little trouble with compatibility except for several commercial packages that refuse to boot and leave a message, "Remove your *Omnimon!*"

Software vendors have a right to be concerned when a good programmer can easily steal a program out of memory, but there are other methods to protect against the board. In fact, the designer, David Young, will explain to vendors methods of destroying parts of the stack that will disable his product. I refuse to remove the board and several times have had to read and disassemble the offending program's loader to remove the test. There have been a few other rare cases where a program has jumped into the *Omnimon!*, but here I suspect someone made illegal hooks into the O.S.

Omnimon! is invaluable as a debugging tool for 400 and 800 computer owners. It will not work on a 1200XL. It certainly will alert you as to why your program hung. With its ability to both examine a program in "suspended animation" and its capacity to access the disk, this board is well worth the price.

1200 BAUD MODEM COMPARISON

	HAYES SMARTMODEM 1200	SIGNALMAN MK 12	US ROBOTICS PASSWORD
LIST PRICE	\$699.00	\$399.00	\$449.00
BAUD RATE	#00—1200 BPS	300—1200 BPS	300—1200 BPS
DIRECT CONNECT	YES	YES	YES
AUTO-ANSWER	YES	YES	YES
AUTO-DIAL	YES	YES	YES
DETECT BUSY SIGNALS & DIAL TONES	NO	YES	NO
SPEAKER BUILD-IN	YES	NO	YES
INDICATOR LIGHTS	YES	YES	NO
RS-232C PORT COMPATIBILITY	YES	YES	YES
CONNECTOR	DB25—FEMALE	DB25—MALE	DB25—MALE
AUTOMATICALLY ADJUSTS TO TRANSMISSION SPEED	YES	YES	YES
FULL & HALF DUPLEX	YES	YES	YES
ASYNCHRONOUS	YES	YES	YES
BELL 103 COMPATIBLE	YES	YES	YES
BELL 212A COMPATIBLE	YES	YES	YES
DEFAULT ECHOES TO SCREEN	YES	YES	NO—MUST TURN ON
COMPATIBILITY WITH HAYES SOFTWARE	YES	95%	90%
PULSE OR TONE DIALING	BOTH	BOTH	BOTH

1200 Baud Modems

One of the media buzz words over the last year, telecommunications, means the ability of one computer to talk to another over standard telephone lines. Industry transfers great quantities of data on special telephone "packet lines." Personal computer owners obtain data from commercial services like *Compuserve*, *The Source*, and Dow Jones, or communicate with others via free bulletin board systems (BBS). Because both systems feature electronic mail, users can leave messages either for the general public or for specific individuals. Some people use modems to swap files and disks, while others hook their computers to larger mainframes at colleges or at work for use as "dumb terminals." The future holds great promise for even more uses. As microcomputers and modems become common in the home, for example, local banks will offer electronic banking by telephone.

As users expand their search for useful databases and encounter toll and long distance telephone charges, speed of data transmission and thus telephone connect time becomes more important. As a result, the slower 300 baud systems are being replaced by 1,200 baud systems (or higher) to cut costs. For this reason, we decided to concentrate on testing 1,200 baud modems instead of the older, more widely used 300 baud units even though these modems cost two to three times more than 300 baud modems. The difference in cost comes about because 300 baud modems use a technique called frequency key shifting (FSK) in which data is modulated over a carrier frequency. It requires a band width of only 1.5 times the baud rate, but twice that if the unit operates in the two-channel full duplex mode. The telephone offers a range from 700-3,000 HZ, or a band width of 2,300 HZ. While adequate for a 300 baud modem, it isn't wide enough for a 1,200 baud modem. You would need a band width of 3,600 HZ if you included the guard band between the two channels.

A high speed modem requires an alternate modulation technique. Manufacturers chose a four-level phase shift keying method (PSK) which increases the effective baud rate by encoding two data bits per baud. This does not mean only a two-fold increase in speed—the baud rate is the modulation rate of the carrier. The modem is rated for transfer at 1,200 bits per second. In essence, the increased bit rate requires transmitter and receiver circuits of greater complexity and higher cost. Some of the complexity comes from the increased sensitivity to noise and distortion over the telephone lines and must compensate for them.

Three manufacturers agreed to submit their best units for evaluation. Several others, including Novation and Cermetek, declines. The latter, a new company in the modem field, has experienced considerable start-up problems with their new unit. Novation, an older company which has received bad press in the past for setting their own standards, just wasn't interested.

Since a substantial amount of communications software has been written with the Hayes protocol in mind, both Signalman and U.S. Robotics advertise their units as virtually Hayes compatible. Actually, they are 90-95% compatible, but subtle differences make several custom-written public domain "hacker" programs inoperable. The two most commonly used terminal programs, *Tele-Talk* by Datamost and *A-Modem Plus* in the public domain, worked flawlessly with all modems. Both are popular because they perform a checksum on the sector data transmitted, verifying that the program being sent will indeed work when received at the other end. While *Tele-Talk* is limited to transferring files of about 210 sectors, *A-Modem Plus* saves data every eight sectors and can save files nearly as long as the disk. A 135-sector file takes about four minutes to transfer at 1,200 baud and sixteen minutes at 300 baud.

Hayes Smartmodem 1200

Hayes features the best selling and most popular modems on the market. Their popularity arose several years ago when they began offering features like auto-dial/auto-answer and direct connect instead of the old fashioned acoustic coupling. So many software houses began writing telecommunication programs using the Hayes commands that their general use spread throughout the industry.

The unit is the Cadillac of modems and has a price to match. It is housed in a metal case 15" x 5 1/2" x 1 1/4". It has eight LED indicator lights behind a detachable, smoked-glass front plate. The configuration switches are set behind the plate. You can use these to disable auto answer, echo characters in the command mode, or send result codes to the printer. The rear has a toggle power switch, a female RS-232C connector, telephone connection, and a volume control for the internal speaker. The speaker is useful for monitoring the progress of the auto dialing without the need for a phone.

Using the modem in the terminal mode is quite simple. If you wanted the modem to auto-dial a local Bulletin Board System (BBS), you would give it the command ATDT 555-1212. The last "T" stands for touch-tone, but you can also use pulse dialing. Commas are used for pauses, useful if you are waiting for the computer tone when calling your local Sprint or MCI numbers. If the line were busy, you could call again later with the repeat command, A/. Unfortunately, this modem cannot detect a busy signal—essential if you were writing a demon-dialer program. It just doesn't connect if the line is busy. It does, however, detect the other modem's baud rate and adjusts accordingly while sending an extended result code and a message to the baud rate of its present operation. If you are in voice contact and you wish to connect the modems, one party will send an answer carrier ATA, and the other an originate carrier ATD. The command ATH hangs up the phone.

The eighty-page, spiral-bound manual is very technical, yet informative and complete. It is especially useful if you are writing your own software. Fortunately, most users need only read a small part to run the modem.

U.S. Robotics — Password

The Password is housed in a no-frills, small plastic case measuring $7\frac{1}{2}'' \times 4\frac{1}{2}'' \times 1\frac{1}{4}''$. There are no LED status lights, but there are four DIP switches in the rear useful for setting auto-answer and data terminal ready modes. The rear also has a sticky and cheap slide switch, a male RS 232A connector, and a telephone connector. The unit contains a marginal pager speaker that sounds terrible. The cheap exterior prompted me to examine the interior. Don't let the exterior fool you—the quality circuit board on the inside is well laid out.

The unit can auto-dial and auto-answer and follows the Hayes protocol of commands. It defaults to no echo, so that you can't see what you are typing. This can be corrected with the command ATE1. The unit isn't entirely Hayes compatible, but works fine with the commercial telecommunications packages that I tested. It has trouble with a few custom written Hayes programs, although I could not determine the reason for this. Because it can't detect a busy signal, it can't be used as a demon-dialer.

The documentation, finally, consists of fifteen printed pages stapled together. While it isn't fancy, it is readable and useful to the first-time user.

Signalman Mark XII

This 1200 baud auto-dial, auto-answer modem is a much less expensive alternative to the Hayes modem. As such, it doesn't have the most sophisticated housing or even a built-in speaker. The plastic case is about the same size as the Hayes unit: $9\frac{1}{2}'' \times 6'' \times 1\frac{1}{8}''$. It has four LED indicator lights and an On/Off rocker switch on the front. The two modular phone jacks on the rear eliminate the need for a splitter—the unit plugs into the phone jack and the phone plugs into it. The modem connects to your system via a male RS-232A connector plug at the end of a one-foot long ribbon cable. There are no switches for changing the default settings which are 1200 baud, full duplex, and auto-answer. This is accomplished entirely by commands.

The modem is generally Hayes-compatible. It worked on all commercial software that I tested; however, I had a problem with the one custom hacker program written for the Hayes (this may just be a matter of timing in the disconnect mode). The Mark XII does have several additional operational features. It can detect a busy signal and be programmed as a demon-dialer. Since it automatically detects and adjusts for the baud rate of the modem on the other end, it sends the proper result code and prints the connect baud rate to the screen.

The twenty-nine page looseleaf documentation was marked "preliminary." The manual is highly technical in nature with pages of commands and result codes. I think the lack of any clear-cut examples will make it difficult reading for beginners.

Conclusion

You can usually judge a product based on price versus performance and features. As to performance, each of the three modems performed up to their claims in the 1200 baud mode. I found no differences when sending or receiving Atari DOS files; files that were sent came back in working order. The Hayes is extremely popular but expensive. It also has the advantage that most software was written for it, and the resale value for a Hayes is very good. The Signalman is the least expensive, with no speaker and a cheap case. The ability to detect busy signals is a very good feature that the other modems lack. The U.S. Robotics unit, finally, is priced somewhere in-between. It has no pretentious frills and doesn't even sport status lights. Software compatibility with the Password is less than for the Signalman modem, but it still uses the valuable Hayes protocol.

RECOMMENDED READING LIST

	TITLE	PUBLISHER	APPROXIMATE RETAIL
(1)	<i>Your Atari Computer</i> A comprehensive and well organized guide to the Atari computer system, excellent for the beginner or advanced BASIC programmer. Contains a wealth of information on such subjects as Atari peripherals, advanced BASIC programming, and Atari graphics, including player-missile graphics. A book definitely worth owning.	Osborne/McGraw Hill	\$17.95
(2)	<i>Mapping The Atari</i> A fine memory guide and sourcebook for Atari home computers. More than a listing of memory locations, it contains detailed explanations. Extensive descriptions of Atari's custom chips surpass those in the Technical User's notes. It is organized by memory location, not subject, so it may intimidate beginners. The most valuable reference book for Machine language programmers.	Compute Books	\$14.95
(3)	<i>De Re Atari</i> A look at Atari's unique graphics and sound features by several top programmers. Chapters on display lists, player-missile graphics, scrolling, character set graphics, display list interrupts, GTIA, and sound. Simple examples, a wealth of information, but tends to be obscure and includes numerous errors.	APX	\$19.95
(4)	<i>Atari Sound and Graphics</i> A sequel to the poor text accompanying Atari 400/800 computers last year. Covers the concepts of sound and graphics in tutorial format. Teaches you to create some special effects.	John Wiley and Sons	\$9.95
(5)	<i>Atari Graphics and Arcade Game Design</i> For advanced BASIC and Assembly language programmers. Develops graphics techniques for arcade games. Presents Atari's advanced graphics. Clear text, flow charts, and working examples. Chapters on custom display lists, GTIA color, player-missile graphics, scrolling, character sets, vertical blanks, display list interrupts, bit mapping, and game theory. One-third BASIC with Machine language subroutines, two-thirds Assembly language. Features four commercial quality arcade games. The author's earlier book (<i>Apple Graphics and Arcade Game Design</i> —The Book Company) is an established-reference for the game industry.	The Book Company	\$19.95

- | | | |
|---|------------------|---------|
| (6) <i>The Atari User's Encyclopedia</i> | The Book Company | \$19.95 |
| <p>Presents a single alphabetical listing, similar to a general purpose encyclopedia, covering every aspect of your Atari computer. Explains programming languages, simplifies operating procedures, clarifies general microcomputer terminology and concepts, and much more. All in a concise, easy to understand alphabetical format.</p> | | |
| (7) <i>Kids and the Atari</i> | Reston | \$19.95 |
| <p>A primer on programming for children, useful for adults. Divides topics into conceptual units, explains with simple illustrative examples. Thirty-three lessons, useful in the classroom. Solutions to assignments for each lesson come at the back. Covers advanced techniques like string manipulation, sound, and graphics in a non-threatening way.</p> | | |
| (8) <i>First Book of Atari Graphics</i> | Compute Books | \$12.95 |
| <p>A compilation of magazine articles with some new material. Mixed quality. Chapters include customizing graphics modes, redefining character sets, animation with character graphics, player-missile graphics, and limited GTIA modes. Also contains useful listings and utilities.</p> | | |
| (9) <i>Atari BASIC: Learning by Using</i> | Elcomp | \$5.95 |
| <p>A thin book, but introduces some sophisticated BASIC programming through short programs and learning exercises. Weak explanations. Not a beginner's book.</p> | | |
| (10) <i>The Atari Assembler</i> | Prentice Hall | \$12.95 |
| <p>The only acceptable Assembly language book available for the Atari. Mainly written for those who own the Atari Assembler Cartridge, the poorest of the Atari assemblers. Assumes no prior knowledge, so plods. Poor writing style. Look around for a better primer.</p> | | |
| (11) <i>Advanced Programming Techniques for your Atari Including Graphics and Voice Programs</i> | TAB Books | \$14.50 |
| <p>A readable text for BASIC programmers. Covers the screen editor, interpretation of the keyboard, file management, but emphasizes graphics. Sections on player-missile string techniques, scrolling, page flipping, character sets, and display lists. BASIC examples use Machine language subroutines only when necessary, followed by thorough commentary. Examples of simple animation. Good for intermediate BASIC programmers.</p> | | |
| (12) <i>Inside Atari DOS</i> | Compute Books | \$19.95 |
| <p>Written by the authors of the Atari operating system. Mainly a commented source listing of Atari DOS. A good guide.</p> | | |

- | | | |
|--|--------------------|---------|
| (13) <i>Atari Technical User's Notes</i> | Atari | \$27.00 |
| <p>Full of information and schematics of the Atari 400/800 computers. Explains the inner workings of the computers from a hardware standpoint. Difficult to read, so recommended for advanced Machine language programmers only.</p> | | |
| (14) <i>The Creative Atari</i> | Creative Computing | \$15.95 |
| <p>A collection of articles from the magazine. A good tutorial on Atari Graphics at the front, but otherwise dated product reviews and games.</p> | | |
| (15) <i>BASIC Exercises for the Atari</i> | Sybex | \$12.95 |
| <p>Designed to teach BASIC through programming exercises. Mainly type in programs, with a structured approach to problem solving using flow charts. Includes income tax, statistics, elementary geometry, and games.</p> | | |

Software Houses

Acorn Software

634 North Carolina Avenue
S.E. Washington, DC 20003
(202) 544-4259
p. 191, 198

Activision, Inc.

5221 Bayshore Fronteg Road
Mountain View, CA 94039
(408) 942-1370
p. 87, 175, 384

Advanced Computing Enterprises

5516 Rosechild
Shawnee, KS 66216
p. 323

Advanced Financial Planning

20922 Pasco Olma
El Toro, CA 92630
(714) 855-1578
p. 225

Adventure International

P.O. Box 3435
Longwood, FL 32750
(305) 862-6917
*p. 25, 31, 32, 91, 100,
112, 114, 116, 170, 181, 324*

Affine Software, Inc.

P.O. Box 2026
Aston, PA 19014
(215) 485-1968
p. 116

Allen Macroware

1906 Carnegie Lane "E"
Redondo Beach, CA 90278
p. 327

Alog Computing

1040 Veronica Springs Road
Santa Barbara, CA 93105
p. 242

Amulet Enterprises, Inc.

P.O. Box 25612
Garfield Heights, OH 44125
(216) 475-7766
p. 260, 329

Analog Software

P.O. Box 23
Worcester, MA 01653
(617) 892-8808
p. 67, 111, 117

APX (See Atari Program Exchange)

Artsci

5547 Satsuma Avenue
North Hollywood, CA 91601
(213) 985-2922
p. 48

Artworx Software Company

150 N. Main Street
Fairport, NY 14450
(716) 425-2833
*p. 20, 56, 59, 124, 198, 245,
268, 283, 343*

Atari, Inc.

P.O. Box 50047
San Jose, CA 95150
(408) 942-1900

*p. 41, 51, 65, 85, 89, 94, 95,
96, 97, 110, 120, 123, 132, 138,
146, 174, 176, 177, 179, 197, 200,
206, 214, 215, 218, 224, 233, 244,
253, 254, 255, 269, 272, 274, 289, 291,
293, 297, 300, 310, 342, 347, 377,
378, 379, 381, 382, 383, 384, 385*

Atari Program Exchange (APX)

P.O. Box 3705
Santa Clara, CA 95055
(408) 727-5603
*p. 22, 50, 51, 58, 61, 90, 109,
119, 120, 123, 138, 142, 156, 161,
166, 175, 184, 190, 201, 202, 203,
204, 205, 222, 224, 238, 249, 250,
254, 256, 261, 262, 265, 270, 271,
273, 276, 278, 279, 281, 282, 284,
285, 286, 288, 289, 290, 291, 292,
293, 294, 295, 296, 308, 309, 311,
319, 321, 325, 329, 330, 334, 342,
343, 344, 345, 362, 365, 366, 367,
369, 371, 372, 375*

Automated Simulations/EPYX

1043 Kiel Court
Sunnyvale, CA 94086
(408) 745-0700
*p. 17, 18, 19, 21, 23, 25, 148,
149, 196, 338*

Avalon Hill Microcomputer Games

4517 Harford Road
Baltimore, MD 21214
(301) 254-5300
*p. 39, 101, 107, 108, 158, 186,
187, 190, 197*

Big Five Software

14617 Victory Blvd., #1
Van Nuys, CA 91411
(213) 782-6861
p. 147

Binary Computer Software

3237 Woodward Avenue
Berkeley, MI 48072
(313) 548-0533
p. 121

Bit Better Software (ABBS)

P.O. Box 28
Laurel, MD 20707
(301) 953-7256
p. 242

BJ Smartware

6507 Bracken Ridge
Cincinnati, OH 45213
(518) 731-4382
p. 326

Bluestone Software

Route 3P.O. Box 358
Hedgesville, WV 25427
(304) 754-8937
p. 272, 275

Bram, Inc.

18779 Kanlake Place N.E.
Seattle, WA 98155
p. 70, 109

Broderbund Software, Inc.

17 Paul Drive
San Rafael, CA 94903
(415) 479-1170
*p. 74, 76, 86, 106, 112, 129, 136,
141, 151, 154, 157, 180, 196, 234*

Budge Company

428 Pala Avenue
Piedmont, CA 94610
(415) 658-8141
p. 127

Business Data Center

6890 Kinne Street
E. Syracuse, NY 13057
(315) 463-5440
p. 76, 180

CBS Electronics

Columbia Group CBS, Inc.
Hangertown, MD 21740
p. 68, 95, 102, 141, 181
CDY Consulting
421 Hanbee
Richardson, TX 75080
(214) 235-2146
p. 328

CE Software

801—73rd Street
Des Moines, IA 50312
(515) 224-1995
p. 248

Coleco

945 Asylum Avenue
Hartford, CT 06105
(203) 278-2381
p. 390

Compuserve Communications

5000 Arlington Center Blvd.
Columbus, OH 43220
(800) 848-8990
p. 258

Computari

9607 Athlone
Dallas, TX 75218
p. 219

Computer Magic, Ltd.

P.O. Box 2634
Huntington Station, NY 11745
(516) 883-0094
p. 101, 165

Computer Seen, The

3272 E. Anaheim
Long Beach, CA 90804
(213) 494-4882
p. 215

Computer Software Services

P.O. Box 17660
Rochester, NY 14621
(716) 467-9326
p. 370

Compuware

15 Center Road
Randolph, NJ 07869
(201) 366-8540
p. 26

Continental Software

11223 S. Hindry Avenue
Los Angeles, CA 90045
(213) 410-3977
p. 218, 223

Cosmi

7031 Crest Road
Palos Verdes, CA 90274
p. 69, 80, 152, 168, 169

Counterpoint Software, Inc.

Suite 140, Sheland Plaza North
Minneapolis, MN 55426
(800) 328-1223
p. 280, 287

Creative Computer Software

230 E. Caribbean Drive
Sunnyvale, CA 94089
(408) 745-1655
p. 222, 224, 261, 262

Datamost

9748 Cozycroft Avenue
Chatsworth, CA 91311
(213) 366-7160
p. 91, 155, 163, 178

Datasoft, Inc.

9421 Winnetka Avenue
Chatsworth, CA 91311
(213) 701-5161
p. 73, 81, 84, 111, 117, 139,
154, 170, 179, 183, 207, 236,
239, 331, 335, 338, 341

Don't Ask Software

2265 Westwood Blvd., #B150
Los Angeles, CA 90064
(213) 397-8811
p. 7, 20, 55, 276, 332, 334, 364

Dorsett Educational Systems, Inc.

P.O. Box 1226
Norman, OK 73070
(405) 288-2300
p. 303

Dynacomp, Inc.

1427 Monroe Avenue
Rochester, NY 14618
(716) 442-8960
p. 45, 54, 55, 59, 221, 315, 365

Eastern House Software

3239 Linda Drive
Winston-Salem, NC 27106
(919) 924-2889
p. 322, 367

Educational Software, Inc.

4565 Cherryvale Avenue
Soquel, CA 95073
(408) 476-4901
p. 133, 258, 288, 298, 299,
301, 302, 309, 312, 330, 341

Edupro

P.O. Box 51346
Palo Alto, CA 94303
(415) 494-2790
p. 282, 287, 316

Edufun

(A Division of Milliken Publishing)
1100 Research Blvd.
St. Louis, MO 63132
(314) 991-4220
p. 277

Eduware

(See Peachtree Software, Inc.)

Elcomp Publishing, Inc.

P.O. Box 1194
Pomona, CA 91769
(714) 623-8314
p. 237

Electronic Arts

2755 Campus Drive
San Mateo, CA 94403
(415) 571-7171
p. 128, 150, 162, 191, 193

English Software Co.

P.O. Box 3185 Dept. C
Redondo Beach, CA 90277
p. 82

EPYX

(See Automated Simulations, Inc.)

First Star Software, Inc.

22 East 41st Street
New York, NY 10017
(212) 889-1073
p. 83

Fox Video Games, Inc.

4701 Patrick Henry Drive
Building 9
Santa Clara, CA 95050
(408) 988-6666

Funsoft (IJG, Inc.)

1953 W. 11th Stree
Upland, CA 91786
(714) 946-5805
p. 135

Gamestar Software

1302 State Street
Santa Barbara, CA 93101
(805) 963-3487
p. 46, 49, 122

Gamma Software

P.O. Box 25625
Los Angeles, CA 90025
(213) 473-7441
p. 50

Gebelli Software

1787 Tribute Road, Suite 6
Sacramento, CA 95815
(916) 925-1432
p. 119, 124, 134, 159, 182

Gentry Software

9421 Winnetka Avenue
Chatsworth, CA 91311
(213) 701-5161
p. 65, 111, 170, 172

Hayden Software

600 Suffolk
Lowell, MA 01853
(617) 937-0200
p. 41, 43, 44, 129, 283

HES (Human Engineered Software)

150 North Hill Drive
Brisbane, CA 94005
(800) 632-7979
p. 115

Icon Software

925 Waverley Street, #102
Palo Alto, CA 94301
p. 369

IJG, Inc. (See Funsoft)

Imagic

981 University Avenue
Los Gatos, CA 95030
(408) 399-2200
p. 114

Infocom, Inc.

55 Wheeler Street
Cambridge, MA 02138
(617) 492-1031
p. 27, 30, 31, 35, 36, 38

In-home Software, Inc.

2485 Dunwin Drive Unit 8
Mississauga Ontario, Canada L5L 1T1
(416) 828-0775
p. 27, 102, 104

Innovative Design Software

P.O. Box 1658
Las Cruces, NM 88004
(505) 522-7373
p. 52, 53, 125, 331

Intelligent Statements

Box 3558
Chapel Hill, NC 27514
p. 57

JV Software

3090 Mark Avenue
Santa Clara, CA 95051
(408) 985-8629
p. 62, 63

Lawrence Hall of Science

Math/Computer Education Project
University of California
Berkeley, CA 94720
(415) 642-3167
p. 316

Lightning Software

Box 11725
Palo Alto, CA 94306
(415) 327-3290
p. 296

LJK Enterprises, Inc.

7852 Big Bend Blvd.
St. Louis, MO 63119
(314) 962-1855
p. 235, 249

London Software

374 Wildwood Avenue
Piedmont, CA 94611
(415) 893-1090
p. 92, 120, 172

L & S Computerware

1589 Fraser Drive
Sunnyvale, CA 94087
(408) 738-3416
p. 194

Luck Software

1160 Niblick Road
Paso Robles, CA 93446
(805) 238-2585
p. 219

Macrotronic, Inc.

1125 N. Golden State Blvd.
Turlock, CA 95380
(209) 667-2888
p. 368

Mattel M-Network

5150 W. Rosecrans Avenue
Hawthorne, CA 90059
(213) 416-9169
p. 380

Maximus, Inc.

6723 Whittier Avenue
McLean, VA 22101
(800) 368-2152
p. 313

Micro D.

17406 Mt. Clifford Circle
Fountain Valley, CA 92708
(714) 540-4781
p. 113

Microprose Software

10616 Beaver Dam Road
Haunt Valley, MD 21031
(301) 357-4739
p. 78, 99, 153

Miles Computing

7136 Haskell Avenue, #204
Van Nuys, CA 91406
(203) 994-6279
p. 216

MMG Micro Software

Box 131
Marlboro, NJ 07746
(201) 431-3472
p. 145, 243, 253, 299, 312, 320

Muse Software

347 N. Charles Street
Baltimore, MD 21201
(301) 659-7212
p. 64

New Venture Communications

3000 Sand Hill Road
Building 1, Suite 110
Menlo Park, CA 94025
(415) 854-2661
p. 394, 399

Nexa Corporation

Box 26468
San Francisco, CA 98072
(415) 387-5800
p. 176

Odesta

930 Pitner
Evanston, IL 60202
(312) 328-7101
p. 40, 42, 45

Optimized Systems Software, Inc.

1173 S. Saratoga Sunnyvale Road
San Jose, CA 95129
(408) 446-3099
p. 346

Parker Brothers

50 Dunham Road
Beverly, MA 01915
(617) 927-7600
p. 153, 166, 385

Peachtree Software

3445 Peachtree Road NE, Ste. 1300
Atlanta, GA 30326
(404) 239-3000
p. 266, 273, 278, 279

Peninsula Instant Replay

2730 St. Giles Lane
Mountain View, CA 94040
(415) 969-9474
p. 281

Penguin Graphics Software

830 Fourth Avenue
Geneva, IL 60134
(312) 232-1984
p. 72, 173

PMI

2500 Lee Road, Suite 210
Winter Park, FL 32789
(305) 644-3822
p. 313

Program Design, Inc.

95 E. Putman Avenue
Greenwich, CT 06830
(203) 861-8799
p. 108, 171, 199, 268, 274, 275, 315

Programmer's Institute

310 1/2 W. Franklin Street
Box 3470 Dept. A
Chapel Hill, NC 27514
(919) 967-0861
p. 217

Programmer's Workshop, The

5230 Clark Avenue, Suite 23
Lakewood, CA 90712
(213) 804-1475
p. 199, 220, 238, 260, 374

Quality Software

6660 Reseda Blvd., Ste. 105
Reseda, CA 91335
(213) 344-6599
p. 16, 43, 44, 134, 192, 203, 361

Reston Publishing Company, Inc.
11480 Sunset Hills Road
Reston, VA 22090
(703) 437-8900
p. 337

Roklan
3335 N. Arlington Heights Road
Arlington Heights, IL 60004
(312) 392-2525
p. 96, 100, 137, 188

Romox, Inc.
501 Vandell Way
Campbell, CA 95008
(408) 374-7200
p. 70, 161, 171, 297

Royal Software
(Computer Palace)
2160 W. 11th Avenue
Eugene, OR 97402
(503) 683-5320
p. 80

Santa Cruz Educational Software
(See Educational Software)

Sar-An Computer Products
12 Scamridge Curve
Buffalo, NY 14221
(716) 632-3441
p. 202

Scholastic, Inc.
2931 E. McCarty Street
P.O. Box 7502
Jefferson City, MO 65102
(800) 325-6149
(212) 505-3410
p. 301

Screenplay
P.O. Box 3558
Chapel Hill, NC 27514
(800) 334-5470
p. 20, 118

Sentient Software, Inc.
Box 4929
Aspen, CO 81612
(303) 925-9293
p. 38

Sierra On-Line Systems
36575 Mudge Ranch Road
Coarsgold, CA 93614
(209) 683-6858
*p. 24, 33, 35, 37, 54, 75, 98,
103, 104, 118, 132, 140, 168, 169*

Silicon Valley Systems
1625 El Camino Real, Ste. 4
Belmont, CA 94022
(415) 593-4344
p. 131, 266

Sirius Software
10364 Rockingham Drive
Sacramento, CA 95827
(916) 366-1195
*p. 34, 87, 97, 98, 105, 110, 113,
121, 130, 136, 151, 156, 165*

Source Telecomputing Corp.
1616 Anderson Road
McLean, VA 22102
(703) 734-7500
p. 257

Spinnaker Software
215 First Street
Cambridge, MA 02142
(617) 868-4700
p. 60, 66, 267, 269, 311

Starpath Software
324 Martin Avenue
Santa Clara, CA 95050
(408) 748-8551
p. 392

Strategic Simulations, Inc.
883 Stierlin Road Building A-200
Mountain View, CA 94043
(415) 964-1353
p. 185, 186, 187

Sublogic Communications Corp.
713 Edgebrook Drive
Champagne, IL 61820
(217) 359-8482
p. 126

SUPERware
2028 Kingshouse Road
Silver Spring, MD 20904
(301) 236-4459
p. 363

Swiftly Software
64 Broadhollow Road
Merrill, NY 11747
(516) 348-0654
p. 105, 143, 206, 331, 332

Synapse Software
5221 Central Avenue, #200
Richmond, CA 94804
(415) 527-7751
*p. 68, 71, 77, 78, 79, 88, 93,
137, 159, 160, 174, 182, 251*

Synergistics Software
830 N. Riverside Dr., Ste. 201
Renston, WA 98055
(800) 331-4768
p. 26, 72, 149

T & F Software Company
10902 Riverside Drive
North Hollywood, CA 91602
(213) 501-3856
p. 259

T.C. Products
1105 Summit Ave., Ste. 110
Plano, TX 75074
p. 115, 173

Thorn EMI Video, Inc.
1370 Avenue of the Americas
New York, NY 10019
(212) 977-8990
p. 52, 53, 82, 144, 164, 189, 192

Tigervision
909 Orchard
Mundelein, IL 60060
(312) 949-8100
p. 381

T.M.Q. Software, Inc.
82 Fox Hill Drive
Buffalo Grove, IL 60090
(312) 520-4440
p. 252

Tronix Publishing, Inc.
701 S. Manchester Avenue
Inglewood, CA 90301
(213) 671-8440
p. 135, 167

United Software of America
750—3rd Avenue
New York, NY 10017
(212) 682-0347
p. 25, 336, 340

Utopia Software, Inc.
58 Millay Road
Morganville, NJ 07751
(201) 536-1191
p. 164

Versa Computing
3541 Old Conejo Road, Ste. 104
Newbury Park, CA 91320
(805) 498-1956
p. 294, 339

Visicorp
2895 Zanker Road
San Jose, CA 95134
(408) 946-9000
p. 214

Xlent Software
P.O. Box 5228
Springfield, VA 22150
(703) 644-8881
p. 370

INDEX

NAME (Company)	DEPARTMENT	PAGE	NAME (Company)	DEPARTMENT	PAGE
Abuse	Entertainment	207	BASIC X/A	Utilities	319
Accounts Receivable	Business	215	BASIC XL	Utilities	346
Action Quest	Entertainment	62	Basketball	Entertainment	51
Addition and Subtraction	Education	287	Berzerk	Entertainment	393
Advanced Music System	Entertainment	201	Bishop's Square/Maxwell's Demon	Entertainment	207
Adventure	Entertainment	26	Blade of Blackpool	Entertainment	34
Adventureland Saga #1	Entertainment	32	Block Buster	Entertainment	192
Adventures of Proto, The	Education	312	Blue Max	Entertainment	93
Adventures of Tron	Entertainment	404	Blueprint	Entertainment	406
A.E.	Entertainment	112	Bond Analysis	Business	254
Air-Raid	Entertainment	90	Bookkeeper, The	Business	215
Air Raiders	Entertainment	386	Boulders and Bombs	Entertainment	181
Airstrike	Entertainment	82	Bridge 2.0	Entertainment	59
Algical	Education	285	Bridgmaster	Entertainment	59
Ali Baba and the Forty Thieves	Entertainment	16	Bug Off	Entertainment	112
Alien Ambush	Entertainment	113	Bulldog Pinball	Entertainment	129
Alien Swarm	Entertainment	104	Buried Bucks	Entertainment	67
Alog Mailist	Business	242	Calculator	Utilities	375
Alpha Shield	Entertainment	110	Canyon Climber	Entertainment	154
Amphibian	Entertainment	180	Captain Cosmo	Entertainment	176
Analogies	Education	274	Car Costs	Business	224
Andromeda	Entertainment	159	Career Counselor	Education	312
Anteater	Entertainment	161	Carnival	Entertainment	111
Anti-Sub Patrol	Entertainment	188	Casdup	Utilities	328
Apple Panic	Entertainment	154	Castle Wolfenstein	Entertainment	64
Arcade Machine	Entertainment	157	Caverns of Khafka	Entertainment	69
Archon	Entertainment	162	Caverns of Mars	Entertainment	89
Arena 3000	Entertainment	118	CCA Data Management System	Business	248
Assembler Editor	Utilities	353	Centipede	Entertainment	6
Asteroid Miners Tutorial	Education	299	Chameleon CRT Emulator	Utilities	372
Asteroids	Entertainment	95	Character Graphics Tutorial	Education	299
Astro Chase	Entertainment	83	Checkers	Entertainment	45
Astro-Quotes	Education	275	Chess 7.0	Entertainment	40
Astrology	Entertainment	205	Choplipter	Entertainment	74
Astron IX	Entertainment	80	Chopper Command	Entertainment	384
Atari Microsoft BASIC	Utilities	347	Chopper Rescue	Entertainment	78
Atari World	Utilities	340	Claim Jumper	Entertainment	159
Atariwriter	Business	233	Clipper	Entertainment	199
Atariwriter Printer Drivers	Utilities	369	Clowns and Balloons	Entertainment	183
Atext	Business	237	Color Accountant, The	Business	217
Atlas of Canada	Education	292	Colortrack and Soundtrack	Utilities	323
Atspeller	Business	238	Combat Leader	Entertainment	186
Attack at EP-CYG-4	Entertainment	109	Compu-Math	Education	278
Attack!	Entertainment	109	Compu-Read	Education	266
A2-PB1 Pinball	Entertainment	126	Compuserve	Business	258
Avalanche	Entertainment	175	Computer Chess	Entertainment	41
Aztec Challenge	Entertainment	152	Computer War	Entertainment	82
Baccarat	Entertainment	55	Controller	Entertainment	197
Backgammon 2.0	Entertainment	45	Conversational Spanish/French/ German/Italian	Education	269
Baja Buggies	Entertainment	122	Convoy Raider	Entertainment	187
Bandits	Entertainment	98	Cosmic Ark	Entertainment	405
Bank Street Writer	Business	234	Cosmic Tunnels	Entertainment	163
Banner Generator	Utilities	367	Counter	Education	282
BASIC Commander	Utilities	320	Countermeasure	Entertainment	377
BASIC Debugger	Utilities	320	Crackpots	Entertainment	400
BASIC Program Compressor	Utilities	321			

NAME (Company)	DEPARTMENT	PAGE	NAME (Company)	DEPARTMENT	PAGE
Cribbage	Entertainment	58	Enhancements to Graph It	Utilities	344
Crisis Mountain	Entertainment	149	Escape from the Mindmaster	Entertainment	394
Crossfire	Entertainment	98	Escape to Equatus	Education	284
Crossword Magic 2.0	Entertainment	194	E.T. Phone Home	Entertainment	65
Crush, Crumble and Chomp	Entertainment	21	European Countries and Capitals	Education	293
Crypts of Terror	Entertainment	27	Everest Explorer	Entertainment	198
Curse of Ra	Entertainment	19	Excalibur	Entertainment	22
Cyborg	Entertainment	38	Extended fig-FORTH	Utilities	362
Cycled	Entertainment	136	Family Finances	Business	218
Cypher Bowl	Entertainment	48	Family Vehicle Expense	Business	224
Dark Crystal	Entertainment	37	Fast Eddie	Entertainment	151
Darts	Entertainment	53	Fastgammon	Entertainment	44
Data Base/Report System	Business	249	FDOS	Utilities	363
Data Management System	Business	250	File Manager 800+	Business	251
Data Perfect	Business	249	File-Fax	Business	252
Datalink	Utilities	322	Final Flight	Entertainment	145
Datestones of Ryn	Entertainment	23	Financial Asset Management System	Business	254
David's Midnight Magic	Entertainment	129	Financial Wizard	Business	219
Deadline	Entertainment	36	Fingerspelling	Education	271
Decathlon	Entertainment	403	Firebird	Entertainment	182
Decision Maker	Business	262	Flags of Europe	Education	293
Defender (VCS)	Entertainment	385	Flash Gordon	Entertainment	391
Defender	Entertainment	85	Floyd of the Jungle	Entertainment	153
Deluxe Invaders	Entertainment	96	Flying Ace	Entertainment	107
Demon Attack	Entertainment	114	Fort Apocalypse	Entertainment	79
Desk Set	Business	260	FORTH Turtle Graphics Plus	Utilities	342
Dig Dug	Entertainment	177	Fortune Hunter	Entertainment	70
Diggerbonk	Entertainment	133	Fraction Factory	Education	280
Disk Doctor	Utilities	326	Fraction Program	Education	281
Disk Utilities	Utilities	330	Frogger	Entertainment	169
Disked	Utilities	329	Frogger (VCS)	Entertainment	401
Diskette Librarian	Utilities	325	Frogmaster	Education	290
Diskey	Utilities	324	Frostbite	Entertainment	400
Diskmenu	Utilities	330	Fun with Art	Utilities	338
Diskscan	Utilities	328	Galahad and the Holy Grail	Entertainment	61
Diskwiz	Utilities	327	Galaxians	Entertainment	120
Dolphin	Entertainment	402	Gateway to Apsai	Entertainment	18
Donkey Kong	Entertainment	146	Genetic Drift	Entertainment	106
Donkey Kong (VCS)	Entertainment	395	Geography	Education	292
Donkey Kong Junior	Entertainment	395	Getaway	Entertainment	138
Dorsett Educational Series	Education	303	Ghost Encounters	Entertainment	62
Dowhill	Entertainment	51	Globe Master	Education	294
Dragon Stopper	Entertainment	399	Go	Entertainment	44
Dragonfire	Entertainment	394	Golf Challenge	Entertainment	54
Draw It 1.0	Utilities	343	Corf	Entertainment	100
Draw Pic	Utilities	343	Graphic Generator	Utilities	335
Drelbs	Entertainment	174	Graphic Master	Utilities	341
Droids	Entertainment	173	Graphics Composer	Utilities	339
Drummesier, The	Entertainment	202	Graphics Machine	Utilities	341
Dunzhin	Entertainment	20	Graphit	Utilities	342
Eastern Front	Entertainment	184	Gridiron Glory	Entertainment	50
Edit 6502	Utilities	355	Gridrunner	Entertainment	115
Edu-Ware Fractions	Education	279	GTIA-Draw	Utilities	340
Edufun! Programs	Education	277	Guns of Fort Defiance	Entertainment	101
Electronic Notebook	Business	260	Gwendolyn	Entertainment	20
Elementary Biology	Education	291	Gypsy	Entertainment	158
Embargo	Entertainment	119	Hard Hat Mack	Entertainment	150
Empire Strikes Back, The	Entertainment	389	Haunted Hill	Entertainment	105
Empire of the Overmind	Entertainment	39	Hazard Run	Entertainment	124
Enduro	Entertainment	407	Hellcat Ace	Entertainment	99
Energy Czar	Education	289	Hellfire Warrior	Entertainment	18

NAME (Company)	DEPARTMENT	PAGE	NAME (Company)	DEPARTMENT	PAGE
Hexabug	Utilities	366	Mail List (MMG Micro)	Business	243
Hi-Res Mastertype	Education	296	Mailing List	Business	244
Hickory Dickory	Education	311	Maniac Miner	Entertainment	65
Hockey	Entertainment	50	Mantis Boot Tape		
Hodge Podge	Education	268	Development System	Utilities	372
Home Accountant, The	Business	218	Mapmaker	Utilities	344
Home Filing Manager, The	Business	253	Mapware	Utilities	345
Home Inventory	Business	222	Marathon	Education	288
Home Inventory (APX)	Business	222	Marauder	Entertainment	103
Home Loan Analysis	Business	261	Market Place, The	Education	294
Hot Lips	Entertainment	172	M*A*S*H	Entertainment	391
Household Finance	Business	222	Racer	Entertainment	124
In Search of the Most			Matchboxes	Entertainment	196
Amazing Thing	Entertainment	60	Math Mission 1.0	Education	285
Instedit Rev.2	Utilities	334	Mathematic Tic-Tac-Toe	Education	288
Intruder!	Entertainment	102	Megafont	Utilities	370
Invitation to Programming #2	Education	300	Meltdown	Entertainment	169
Invitation to Programming #3	Education	300	Map Tutorial	Education	301
Ion Roadway	Entertainment	123	Meteor Storm	Entertainment	80
Jawbreaker	Entertainment	381	Metric & Problem Solving	Education	278
Jawbreaker II	Entertainment	140	Mickey in the Great Outdoors	Education	272
Jedi Arena	Entertainment	387	Micro Painter	Utilities	338
Jeepers Creepers	Entertainment	134	Microsailing	Entertainment	166
Journey to the Planets	Entertainment	63	Microsoft BASIC Cross-Reference	Utilities	321
Joust	Entertainment	174	Midway Campaign	Entertainment	187
Juggles' Rainbow & Juggles' House	Education	310	Miles Payroll System	Business	216
Juice	Entertainment	167	Miner 2049er	Entertainment	147
Jukebox #1	Entertainment	203	Mini Database/Dialer	Business	258
Jumbo Jet Pilot	Entertainment	144	Mini-DOS Plus	Utilities	331
Jumpman	Entertainment	148	Missile Command	Entertainment	110
Jumpman Junior	Entertainment	149	Mission: Asteroid	Entertainment	35
Jungle Hunt	Entertainment	398	MMG Data Manager	Business	253
Kaboom	Entertainment	175	Money Manager	Business	220
Kangaroo	Entertainment	156	Money Processor, The	Business	219
Kayos	Entertainment	101	Monkeymath	Education	283
Ken Uston's Professional			Monkey up a Tree	Education	281
Blackjack	Entertainment	57	Monkey Wrench	Utilities	322
Keypad Controller	Utilities	373	Moon Patrol	Entertainment	108
Keystone Kapers	Entertainment	402	Moon Shuttle	Entertainment	117
Kid Grid	Entertainment	135	Moonbase Io	Entertainment	108
Kindercomp	Education	311	Morloc's Tower	Entertainment	25
K-Razy Antics	Entertainment	141	Mortgage and Loan Analysis	Business	224
K-Razy Shootout	Entertainment	95	Mountain King	Entertainment	68
K-Star Patrol	Entertainment	102	Mouseattack	Entertainment	140
Labyrinth	Entertainment	136	Mr. Cool	Entertainment	168
Language Lab Drill Kit II	Education	272	Mr. Do	Entertainment	380
Legionnaire	Entertainment	186	Mr. Robot	Entertainment	155
Letter Perfect	Business	235	Ms. Pac-Man (5200)	Entertainment	379
Letter Writer	Business	238	Ms. Pac-Man (VCS)	Entertainment	381
Loan Analyzer	Business	261	M.U.L.E.	Entertainment	193
Lock and Chase	Entertainment	380	Music 1 Terms and Notations	Education	308
Loderunner	Entertainment	151	Music Composer	Entertainment	200
Lost Colony	Entertainment	191	Music Major	Education	309
Lunar Leapers	Entertainment	75	Music Player	Utilities	365
Mac 65	Utilities	354	Musical Computer—A Music Tutor	Education	309
Machine Language Monitor	Utilities	367	Musical Mathematics	Education	283
Macro-Assembler	Utilities	353	MXPlus	Hardware	413
Mad Netter	Entertainment	165	My First Alphabet	Education	265
MAE	Utilities	354	My Spelling Easel	Education	274
Magic Mail	Business	242	Name That Song	Entertainment	203
Mail List (Artworx)	Business	245	Necromancer	Entertainment	160

NAME (Company)	DEPARTMENT	PAGE	NAME (Company)	DEPARTMENT	PAGE
Night Raiders	Entertainment	91	Protector	Entertainment	77
Nightstrike	Entertainment	115	Protector II	Entertainment	78
No Escape	Entertainment	404	Punctuation Put-On	Education	276
Nuclear Bomber	Entertainment	187	Q*Bert	Entertainment	166
Nukewar	Entertainment	187	Qix	Entertainment	179
Number Blast	Education	286	QS FORTH	Utilities	361
Number Relationships	Education	282	QS Reversi	Entertainment	43
Odin	Entertainment	42	Quarxon	Entertainment	120
Oil's Well	Entertainment	132	Raiders of the Lost Ark	Entertainment	393
Oink	Entertainment	406	Rapid Reader	Education	266
Omnimon!	Hardware	414	Raster Blaster	Entertainment	127
Orc Attack	Entertainment	164	Real Sports Baseball	Entertainment	383
O'Riley's Mine	Entertainment	73	Real Sports Football	Entertainment	382
Outlaw/Howitzer	Entertainment	119	Real Sports Soccer	Entertainment	382
Overview of FORTH	Utilities	360	Real Sports Volleyball	Entertainment	383
Pacific Coast Highway	Entertainment	170	Rear Guard	Entertainment	100
Pac-Man	Entertainment	132	Repton	Entertainment	87
Pac-Man (VCS)	Entertainment	384	Rescue at 94K	Entertainment	76
Paint	Utilities	337	Rescue at Rigel	Entertainment	23
Password	Hardware	417	Retirement Planning	Business	225
Pathfinder	Entertainment	134	Return of the Jedi	Entertainment	388
Personal Finance System	Business	221	Reversal	Entertainment	43
Personal Fitness Program	Entertainment	204	Rhymes and Riddles	Education	269
Pharaoh's Curse	Entertainment	68	Ricochet	Entertainment	196
Phobos	Entertainment	90	River Raid	Entertainment	87
Phoenix	Entertainment	389	River Raid (VCS)	Entertainment	390
Picnic Paranoia	Entertainment	182	Robot Tank	Entertainment	387
Picture-Play	Education	316	Safetyline	Education	313
Piece of Cake	Education	287	Salmon Run	Entertainment	161
Pill, The	Utilities	370	S.A.M. (Software		
Pilot	Education	314	Automatic Mouth)	Utilities	364
Pinball Construction Kit	Entertainment	128	Sammy the Sea Serpent	Education	268
Pinhead	Entertainment	164	Sargon II	Entertainment	41
Pirate Adventure Saga #2	Entertainment	31	Scott Adams' Adventure Series	Entertainment	28
Pitfall	Entertainment	397	Scram	Entertainment	197
Planet Miners	Entertainment	187	Screen Maker	Utilities	369
Planetfall	Entertainment	35	Screen Printer Interface	Utilities	368
Player Piano	Entertainment	202	Sea Bandit	Entertainment	172
pm Animator	Utilities	334	Sea Dragon	Entertainment	91
Pogoman	Entertainment	178	Sea Fox	Entertainment	106
Poker Tourney	Entertainment	56	Serpentine	Entertainment	141
Pokersam	Entertainment	55	Seven Card Stud	Entertainment	58
Polaris	Entertainment	390	747 Landing Simulator	Entertainment	142
Pole Position	Entertainment	123	Shamus	Entertainment	137
Polycalc	Education	286	Shamus: Case II	Entertainment	71
Pool	Entertainment	52	Shattered Alliance	Entertainment	185
Pool 1.5	Entertainment	53	Shooting Arcade	Entertainment	111
Pool 400	Entertainment	52	Signalman Mark XII	Hardware	417
Pooyan	Entertainment	179	Sky Blazer	Entertainment	86
Popeye	Entertainment	153	Sky Jinks	Entertainment	405
Porky's	Entertainment	396	Slinky	Entertainment	168
Pre-School Library	Education	313	Smurf: Rescue in		
Prefixes	Education	271	Gargamel's Castle	Entertainment	398
Preppie	Entertainment	170	Snake Byte	Entertainment	165
Preppie II	Entertainment	138	Snapper, The	Entertainment	131
Presidents of the U.S.	Education	295	Snark Hunt	Entertainment	190
Primary Phonics Lab 1	Education	275	Sneakers	Entertainment	105
Princess and the Frog	Entertainment	171	Snooper Troops #1	Entertainment	66
Pro Golf	Entertainment	54	Soccer	Entertainment	47
Probe One: The Transmitter	Entertainment	72	Soccer (VCS)	Entertainment	378
Property Management Program 2000	Business	259	Solar Fox	Entertainment	386

NAME (Company)	DEPARTMENT	PAGE	NAME (Company)	DEPARTMENT	PAGE
Source, The	Business	257	Three R Math Classroom Kit	Education	279
Space Ace	Entertainment	120	Three R Math System	Education	288
Space Eggs	Entertainment	97	Threshold	Entertainment	104
Space Invaders	Entertainment	97	Tigers in the Snow	Entertainment	187
Space Shuttle—Module One	Entertainment	143	Time Runner	Entertainment	135
Speed-O-Disk	Utilities	329	Touch Typing	Education	297
Speedway Blast	Entertainment	125	Track Attack	Entertainment	180
Spell Wizard	Business	239	Triad	Entertainment	116
Spelling Bee Games	Education	273	Tricky Tutorial		
Spider Fighter	Entertainment	390	#9—GTIA Graphics	Education	302
Spiderman	Entertainment	407	Tricky Tutorial		
Spiderquake	Entertainment	170	#10—Sound Effects	Education	302
Spy Strikes Back, The	Entertainment	72	Tricky Tutorials	Education	298
Spy's Demise	Entertainment	173	Trion	Entertainment	92
Squish'em	Entertainment	156	Trivia Trek	Entertainment	206
Star Island	Entertainment	121	Tumblebugs	Entertainment	139
Star League Baseball	Entertainment	46	Turmoil	Entertainment	113
Star Raiders	Entertainment	94	Turtle Tracks	Education	301
Star Sentry	Entertainment	117	Tutankham	Entertainment	404
Starbowl Football	Entertainment	49	Tutti Frutti	Entertainment	181
Starcross	Entertainment	27	Typo	Education	297
Starquest/Star Warrior	Entertainment	19	Typo Attack	Education	296
Starware	Education	290	Ultima II	Entertainment	24
Stat Plus	Utilities	374	Ulysses & the Golden Fleece	Entertainment	33
States and Capitals	Education	293	Utility Diskette II	Utilities	371
Statistics I	Education	291	Vanguard	Entertainment	377
Stellar Shuttle	Entertainment	76	Vaults of Zurich	Entertainment	198
Stock Analysis	Business	255	Venture	Entertainment	397
Stock Charting	Business	255	Video Easel	Entertainment	206
Stock Management	Business	256	Video Math Flashcards	Education	284
Stocks and Bonds	Entertainment	190	VisiCalc	Business	214
Story Machine	Education	267	Wallwar	Entertainment	118
Strategic Financial Ratio Analysis	Business	262	Warlock's Revenge	Entertainment	26
Stratos	Entertainment	114	Wavy Navy	Entertainment	121
Strawberry Shortcake	Entertainment	401	Wayout	Entertainment	130
Strip Poker	Entertainment	56	What's Different	Education	315
Stun Trap	Entertainment	116	What's in Your Lunch	Education	316
Submarine Commander	Entertainment	189	Wizard and the Princess	Entertainment	33
Super Breakout	Entertainment	176	Wizard of Wor	Entertainment	137
Super Cobra	Entertainment	385	Word Race	Education	276
Super Cubes and Slip	Entertainment	192	Word Wiz	Entertainment	199
Supercharger and Phaser Patrol	Entertainment	392	Wordgo	Education	273
Survival	Entertainment	25	Wordmaker	Education	270
Survivor	Entertainment	88	Worms	Entertainment	191
Suspended	Entertainment	38	Zaxxon	Entertainment	84
Swamp Chomp	Entertainment	171	Zaxxon (VCS)	Entertainment	392
Synassembler	Utilities	355	Zeppelin	Entertainment	88
Tach Master	Utilities	331	Zombies	Entertainment	70
Tail of Beta Lyrae	Entertainment	81	Zork	Entertainment	30
Talk to Me	Utilities	365	Zork II	Entertainment	30
Tax Advantage, The	Business	223	Zork III	Entertainment	31
Teacher's Aid	Education	315			
Teasers by Tobbs	Education	289			
Tele Tari	Utilities	322			
Tele-Talk	Utilities	333			
Temple of Apsai	Entertainment	17			
Tennis	Entertainment	378			
Terry	Entertainment	204			
Text Wizard	Business	236			
3-D Supergraphics & Color Game					
Development System	Utilities	336			

Books For

1



The Book of IBM Software 1984
 Edited by Robert P. Wells, Ph.D., Sandra Rochowansky and Michael Mellin, Ph.D.
 ISBN 0-912003-02-2
 \$19.95

2



The Book of Apple Software 1984
 Edited by Jeffrey Stanton, Robert P. Wells, Ph.D., Sandra Rochowansky and Michael Mellin, Ph.D.
 ISBN 0-912003-03-0
 \$19.95

3



The Book of Atari Software 1984
 Edited by Jeffrey Stanton, Robert P. Wells, Ph.D., Sandra Rochowansky and Michael Mellin, Ph.D.
 ISBN 0-912003-04-8
 \$19.95

7



WHAT IF...?
 A Guide to Computer Modeling
 By Tom Simonds
 ISBN 0-912003-00-6
 \$19.95

8



Apple Graphics and Arcade Game Design
 By Jeffrey Stanton
 ISBN 0-912003-01-4
 \$19.95

9



Atari Graphics and Arcade Game Design
 By Jeffrey Stanton with Dan Pinal
 ISBN 0-912003-02-1
 \$16.95

13



The Texas Instruments User's Encyclopedia
 (TI-99, 2, 4, 4A and 8)
 By Gary Phillips and David Reese
 ISBN 0-912003-15-4
 \$14.95

14



The Apple User's Encyclopedia
 (Apple II, II+, IIe, III)
 By Gary Phillips, Joyce Conklin and Donald J. Scellato
 ISBN 0-912003-14-6
 \$19.95

15



The Atari User's Encyclopedia
 By Gary Phillips and Jerry White
 ISBN 0-912003-17-7
 \$19.95

All Reasons

4



**Commodore 64
Color Graphics: A
Beginner's Guide**
By Shaffer &
Shaffer Applied
Research &
Development
ISBN 0-912003-06-3
\$14.95

5



**The TRS-80 User's
Encyclopedia
(Models I, III
and 4)**
By Gary Phillips
and James E.
Potter
ISBN 0-912004-12-X
\$19.95

6



**The Times/
Sinclair User's
Encyclopedia
(TS1000, TS2068
and ZX81)**
By Gary Phillips
and James C.
March
ISBN 0-912004-10-2
\$14.95

10



**Commodore 64
Color Graphics:
An Advanced
Guide**
By Shaffer &
Shaffer Applied
Research &
Development
ISBN 0-912003-07-3
\$14.95

11



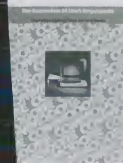
**The TRS-80 User's
Encyclopedia
(Model 100)**
By Gary Phillips,
Jacquelyn Smith
and Julia
Menapace
ISBN 0-912003-13-8
\$14.95

12



**The TRS-80 User's
Encyclopedia
(Color Computer
and MC-10)**
By Gary Phillips
and Guier S.
Wright III
ISBN 0-912004-11-1
\$14.95

6



**The Commodore
64 User's
Encyclopedia**
By Gary Phillips,
Sanjiva K. Nath
and Terry Silveria
ISBN 0-912003-10-3
\$14.95

17



**The Commodore
VIC-20 User's
Encyclopedia**
By Gary Phillips,
Roger Tierce,
Sanjiva K. Nath
and Terry Silveria
ISBN 0-912003-09-X
\$14.95

*THE BOOK
COMPANY*

A DIVISION OF ARTIS-INC.

11223 S. Hindry Avenue, Los Angeles, CA 90045



Available at computer stores everywhere or directly from The Book Company.

Title	Qty	Price	Total
1. The Book of IBM Software 1984		\$19.95	
2. The Book of Apple Software 1984		\$19.95	
3. The Book of Atari Software 1984		\$19.95	
4. Commodore 64 Color Graphics: A Beginner's Guide		\$14.95	
5. The TRS-80 User's Encyclopedia (Models I, III, 4)		\$19.95	
6. The Times/Sinclair User's Encyclopedia (Model 100)		\$14.95	
7. WHAT IF...? A Guide to Computer Modeling		\$19.95	
8. Apple Graphics and Arcade Game Design		\$19.95	
9. Atari Graphics and Arcade Game Design		\$16.95	
10. Commodore 64 Color Graphics: An Advanced Guide		\$14.95	
11. The TRS-80 User's Encyclopedia (Model 100)		\$14.95	
12. The TRS-80 User's Encyclopedia (Color Computer and MC-10)		\$14.95	
13. The Texas Instruments User's Encyclopedia (TS1000, TS2068, ZX81)		\$14.95	
14. The Apple User's Encyclopedia (Apple II, II+, IIe, III)		\$19.95	
15. The Atari User's Encyclopedia		\$19.95	
16. The Commodore 64 User's Encyclopedia		\$14.95	
17. The Commodore VIC-20 User's Encyclopedia		\$14.95	
18. Tips on Buying Software		N/C	

Visa, MasterCard, Check or Money Order accepted.

Name _____

Address _____

City _____ State _____ Zip _____

Exp. Date _____

☐ Visa ☐ MasterCard

Card # _____

Signature _____

Total Amount Enclosed \$ _____ (California residents add sales tax. Postage will be paid by The Book Company.)

Mail to: THE BOOK COMPANY, Dept. ATA-S, 11223 S. Hindry Avenue, Los Angeles, CA 90045. Or call 213/410-9466 and ask for "Product Information."

Available at computer stores everywhere or directly from The Book Company.

Title	Qty	Price	Total
1. The Book of IBM Software 1984		\$19.95	
2. The Book of Apple Software 1984		\$19.95	
3. The Book of Atari Software 1984		\$19.95	
4. Commodore 64 Color Graphics: A Beginner's Guide		\$14.95	
5. The TRS-80 User's Encyclopedia (Models I, III, 4)		\$19.95	
6. The Times/Sinclair User's Encyclopedia (Model 100)		\$14.95	
7. WHAT IF...? A Guide to Computer Modeling		\$19.95	
8. Apple Graphics and Arcade Game Design		\$19.95	
9. Atari Graphics and Arcade Game Design		\$16.95	
10. Commodore 64 Color Graphics: An Advanced Guide		\$14.95	
11. The TRS-80 User's Encyclopedia (Model 100)		\$14.95	
12. The TRS-80 User's Encyclopedia (Color Computer and MC-10)		\$14.95	
13. The Texas Instruments User's Encyclopedia (TS1000, TS2068, ZX81)		\$14.95	
14. The Apple User's Encyclopedia (Apple II, II+, IIe, III)		\$19.95	
15. The Atari User's Encyclopedia		\$19.95	
16. The Commodore 64 User's Encyclopedia		\$14.95	
17. The Commodore VIC-20 User's Encyclopedia		\$14.95	
18. Tips on Buying Software		N/C	

Visa, MasterCard, Check or Money Order accepted.

Name _____

Address _____

City _____ State _____ Zip _____

Exp. Date _____

☐ Visa ☐ MasterCard

Card # _____

Signature _____

Total Amount Enclosed \$ _____ (California residents add sales tax. Postage will be paid by The Book Company.)

Mail to: THE BOOK COMPANY, Dept. ATA-S, 11223 S. Hindry Avenue, Los Angeles, CA 90045. Or call 213/410-9466 and ask for "Product Information."

Available at computer stores everywhere or directly from The Book Company.

Title	Qty	Price	Total
1. The Book of IBM Software 1984		\$19.95	
2. The Book of Apple Software 1984		\$19.95	
3. The Book of Atari Software 1984		\$19.95	
4. Commodore 64 Color Graphics: A Beginner's Guide		\$14.95	
5. The TRS-80 User's Encyclopedia (Models I, III, 4)		\$19.95	
6. The Times/Sinclair User's Encyclopedia (Model 100)		\$14.95	
7. WHAT IF...? A Guide to Computer Modeling		\$19.95	
8. Apple Graphics and Arcade Game Design		\$19.95	
9. Atari Graphics and Arcade Game Design		\$16.95	
10. Commodore 64 Color Graphics: An Advanced Guide		\$14.95	
11. The TRS-80 User's Encyclopedia (Model 100)		\$14.95	
12. The TRS-80 User's Encyclopedia (Color Computer and MC-10)		\$14.95	
13. The Texas Instruments User's Encyclopedia (TS1000, TS2068, ZX81)		\$14.95	
14. The Apple User's Encyclopedia (Apple II, II+, IIe, III)		\$19.95	
15. The Atari User's Encyclopedia		\$19.95	
16. The Commodore 64 User's Encyclopedia		\$14.95	
17. The Commodore VIC-20 User's Encyclopedia		\$14.95	
18. Tips on Buying Software		N/C	

Visa, MasterCard, Check or Money Order accepted.

Name _____

Address _____

City _____ State _____ Zip _____

Exp. Date _____

☐ Visa ☐ MasterCard

Card # _____

Signature _____

Total Amount Enclosed \$ _____ (California residents add sales tax. Postage will be paid by The Book Company.)

Mail to: THE BOOK COMPANY, Dept. ATA-S, 11223 S. Hindry Avenue, Los Angeles, CA 90045. Or call 213/410-9466 and ask for "Product Information."

FROM:



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 6 LOS ANGELES, CA

POSTAGE WILL BE PAID BY ADDRESSEE

The Book Company
11223 S. Hindry Avenue
Los Angeles, CA 90045



FROM:



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 6 LOS ANGELES, CA

POSTAGE WILL BE PAID BY ADDRESSEE

The Book Company
11223 S. Hindry Avenue
Los Angeles, CA 90045



FROM:



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 6 LOS ANGELES, CA

POSTAGE WILL BE PAID BY ADDRESSEE

The Book Company
11223 S. Hindry Avenue
Los Angeles, CA 90045



KEEPING CURRENT

A major difficulty in publishing a book of software reviews lies in keeping abreast of the almost daily introduction of new programs. By the time a book is printed and in the hands of consumers, there are many new programs that are not included.

To keep our readers as up to date as possible, *The Book* will offer the following service.

The Book itself will be published once a year, usually in the autumn. In between, our readers may subscribe to our update service. We will publish an update to *The Book* containing those programs that were not able to be included in the last edition of *The Book* or since the last update. The cost of this service will be \$10.00 a year for two updates. Considering the cost of software, *The Book* and the subscription service should pay for themselves many times throughout the year by reducing or eliminating the money spent on inappropriate purchases.

Simply fill out the bottom of this form, tear out the page, fold where indicated and mail postage paid to us along with your check or credit card number.

The Book of Atari Software

Name _____

Address _____

Calif. sales tax

transit district residents - 6.5% (\$.98)

(includes Alameda, Contra Costa, San Francisco, Santa Clara, Santa Cruz, Los Angeles and San Mateo Counties)

All other residents - 6% (\$.90)

1 year subscription

\$15.00

CA residents add tax

(see left)

Postage and Handling

Bulk rate (add \$1.00)

1st class (add \$2.00)

*Foreign Airmail (\$5.00)

TOTAL DUE

[] Enclosed is my check

[] Please charge my credit card _____

[] Visa

[] Master Card

Card #..... Exp. date.....

(MC Bank #.....)

*Foreign orders please use U.S. funds payable through a U.S. bank.

FROM: _____



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 6 LOS ANGELES, CA

POSTAGE WILL BE PAID BY ADDRESSEE

THE BOOK COMPANY

11223 S. Hindry Avenue
Los Angeles, CA 90045

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

